DELAWARE DEPARTMENT OF TRANSPORTATION

State of Delaware

Request for Proposal

Title: **PORTABLE DYNAMIC MESSAGE SIGNS**

Contract ID: **DOT2007-PORT_DMS**

- Deadline to Respond –

TUESDAY, DECEMBER 8, 2020

PRIOR TO 2:00 P.M. Local Time

Responses to be received at:

State of Delaware
DEPARTMENT OF TRANSPORTATION
Administration Building
Contract Administration
800 Bay Road, Dover, DE 19901

QUESTIONS are to be submitted via e-mail to dot-ask@state.de.us.

Responses to Questions will be posted to this project at http://www.bids.delaware.gov.

PORTABLE DYNAMIC MESSAGE SIGNS

ALL VENDORS:

The enclosed packet contains a "REQUEST FOR PROPOSAL" consisting of the following documents:

Contents:

INFORMATIONAL DOCUMENTS: *(not required to be returned with bid)*

1 – Sample Monthly Usage Report (Sample Report 1)
2 – Sample Subcontracting (2nd Tier) Quarterly Reporting (Sample Report 2)
3 – Office of Supplier Diversity (OSD) Application Information
4 – Proposal Reply Requirements

REQUIRED BID DOCUMENTS: *(MUST be completed and returned with your bid)*

ATTACHMENT A – NON-COLLUSION STATEMENT
ATTACHMENT B – SUBCONTRACTOR INFORMATION FORM
ATTACHMENT C – BUSINESS REFERENCES
ATTACHMENT D – CONFIDENTIAL AND PROPRIETARY INFORMATION
ATTACHMENT E – BID FORM – (Paper)
ATTACHMENT F – EXCEPTION FORM

All above documents are made part of this solicitation and are contained within this file, or available for download at the following site: http://bids.delaware.gov/.

In order for your response to be considered, the REQUIRED BID DOCUMENTS must be executed completely and correctly and received in a sealed envelope clearly displaying the contract number and vendor name prior to the due date and time.

COMPETITIVE SEALED PROPOSAL

The Department has determined, pursuant to **Delaware Code Title 29, Chapter 6924(a)** that this solicitation be offered as a request for competitive sealed proposals because the use of competitive sealed bidding is not practical and/or not in the best interest of the State. The use of competitive sealed proposals is necessary to:

- Use a contract other than a fixed-price type; or
- Conduct oral or written discussions with vendors concerning technical and price aspects of their proposals; or
- Afford vendors an opportunity to revise their proposals through best and final offers; or
- Compare the different price, quality and contractual factors of the proposals submitted; or
- Award a contract in which price is not the determining factor.

PORTABLE DYNAMIC MESSAGE SIGNS

PROJECT INFORMATION

This Request for Proposal (RFP) issued by the Delaware Department of Transportation (DelDOT) is for the purpose of acquiring Proposals from qualified firms to provide trailer-mounted, full matrix, LED (light emitting diode) Portable Dynamic Message Signs (DMS), training, and warranty.

1.1. KEY RFP DATES/MILESTONES

The following dates and milestones apply to this RFP and contract award. Vendors are advised that these dates and milestones are not absolute and may change by Addendum or due to unplanned events during the bid proposal and award process.

Activity	Due Date / Time
Questions Due - No Later Than:	November 25, 2020 3:00 P.M.
Final Questions/Answers Posted:	One week prior to Proposal Due Date
Proposals Due - Prior To Public Opening:	Tuesday, December 8, 2020
Contract Award	Within 90 days of bid opening

1.2. INQUIRIES & QUESTIONS

We welcome your interest in working with us, and we will be pleased to answer any questions you may have in formulating your response to this Request for Proposal.

All questions must be received by DelDOT at the following email address prior to the 'Questions Due' date and time shown above in order to be addressed:

EMAIL QUESTIONS TO: dot-ask@delaware.gov

Questions with regard to the interpretation of this solicitation, drawings, or specifications, or any other aspect of this RFP must make specific reference to the section(s) and page numbers of the RFP where applicable. All communications with DelDOT regarding this RFP are to be made through email to the 'dot-ask' email address.

Responses issued by DelDOT will be posted on the http://bids.delaware.gov/ website. Vendors should rely only on written statements issued by DelDOT regarding this RFP. Information otherwise obtained is not valid.

Direct contact with State of Delaware employees other than DelDOT's Contract Administration staff regarding this RFP is expressly prohibited without prior consent. *Vendors directly contacting State of Delaware employees risk elimination of their proposal from further consideration*. Exceptions exist only for organizations currently doing business in the State who require contact in the normal course of doing that business.

1.3. MANDATORY PREBID MEETING

A pre-bid meting has not been established for this Request for Proposal.

1.4. BID BOND REQUIREMENT

The Bid Bond requirement has been waived.

1.5. PERFORMANCE BOND REQUIREMENT

The Performance Bond requirement has been waived.

1.6. CONTRACT PERIOD

Each successful Vendor's contract shall be valid for a three (3) year period. The contract may be extended for up to two (2), one (1) year periods through negotiation between the Vendor and DelDOT. Negotiation should be initiated no later than ninety (90) days prior to the termination of the agreement period.

The State reserves the right to extend this contract on a month-to-month basis for a period of up to three months after the term of the contract has been completed.

1.7. PRICES

Prices and/or rates shall remain firm for the initial three (3) year term of the contract, unless further negotiations are deemed necessary by the State. The pricing policy that you choose to submit must be clear, accountable and auditable and must cover the full spectrum of services required. Submittal must be structured as described.

1.8. PRICE ADJUSTMENT

The Vendor is not prohibited from offering a price reduction on its services or materiel offered under the contract. The State is not prohibited from requesting a price reduction on those services or materiel during the initial term or any subsequent options that the State may agree to exercise.

If agreement is reached to extend this contract beyond the initial three (3) year term, DelDOT and the Vendor must agree in writing to any revised pricing.

1.9. SHIPPING TERMS

FOB destination, freight prepaid and allowed

2. SCOPE OF WORK

The Vendor(s) shall provide all equipment, materials and labor to supplement DelDOT's need for Portable Dynamic Message Signs as described herein. The contract will require the Vendor(s) to cooperate with DelDOT to ensure the State receives the most current state-of-the-art material and/or services.

2.1. BACKGROUND

The Department utilizes Portable Dynamic Message Signs (Portable DMS or PDMS) to deliver construction advisories and traffic pattern information along the transportation system. The PDMS system is a traffic control device that is capable of displaying a variety of messages to inform motorists of unusual driving conditions. This system will work in conjunction of the statewide Integrated Transportation Management System (ITMS) initiative undertaken to provide for the safe and efficient management of the transportation system.

2.2. MANDATORY INSURANCE REQUIREMENTS

As a part of the contract requirements, the awarded firm must obtain at its own cost and expense and keep in force and effect during the term of this contract, including all extensions, the minimum coverage limits specified below with a surety satisfactory to the State. Awarded firms must carry the following coverage and provide a certificate of insurance after award:

a. Worker's Compensation and Employer's Liability Insurance in accordance with applicable law.

b. Commercial General Liability - $1,000,000 per occurrence/$3,000,000 per aggregate.

c. Product Liability - $1,000,000 per occurrence/$3,000,000 aggregate.

d. Automotive Liability Insurance covering all automotive units used in the work (including all units leased from and/or provided by the State to Vendor pursuant to this Agreement as well as all units used by Vendor, regardless of the identity of the registered owner, used by Vendor for completing the Work required by this

Agreement to include but not limited to transporting Delaware clients or staff), providing coverage on a primary non-contributory basis with limits of not less than:

1. $1,000,000 combined single limit each accident, for bodily injury;
2. $250,000 for property damage to others;
3. $25,000 per person per accident Uninsured/Underinsured Motorists coverage;
4. $25,000 per person, $300,000 per accident PIP benefits if carrying any of our clients or employees; and
5. Comprehensive coverage for all vehicles leased from the State of Delaware Fleet Services which shall cover the replacement cost of the vehicle in the event of collision, damage or other loss.

Should any of the above described policies be cancelled before expiration date thereof, notice must be delivered in accordance with the policy provisions.

Before any work is done pursuant to this Agreement, the Certificate of Insurance and/or copies of the insurance policies, referencing the contract number stated herein, shall be filed with the State. The certificate holder is as follows:

Delaware Department of Transportation, P.O. Box 800, Dover, DE 19903 – ITB: DOT2007

In no event shall the State or Department be named as an additional insured on any policy required under this agreement.

Nothing contained herein shall restrict or limit the Vendor's right to procure insurance coverage in amounts higher than those required by this Agreement. To the extent that the Vendor procures insurance coverage in amounts higher than the amounts required by this Agreement, all said additionally procured coverages will be applicable to any loss or claim and shall replace the insurance obligations contained herein.

To the extent that Vendor has complied with the terms of this Agreement and has procured insurance coverage for all vehicles Leased and/or operated by Vendor as part of this Agreement, the State of Delaware's self-insured insurance program shall not provide any coverage whether coverage is sought as primary, co-primary, excess or umbrella insurer or coverage for any loss of any nature.

2.3. TECHNICAL SPECIFICATIONS

The Technical Specifications of this RFP are stated in **Section 9**

2.4. OR EQUAL (PRODUCTS BY NAME)

Specifications of products by name are intended to be descriptive of quality or workmanship, finish and performance. Desirable characteristics are not intended to be restrictive. Substitutions of products for those named will be considered provided the vendor certifies that the function, characteristics, performance and endurance qualities of the material offered is equal or superior to that specified. DelDOT must approve any substitutions in writing.

3. PROPOSAL REQUIREMENTS

This section prescribes the mandatory format for the presentation of a proposal in response to this RFP. Each Vendor must provide every component listed in the order shown below, using the format prescribed for each component. A proposal may be rejected if it is incomplete or conditional.

The Request for Proposal contains required Forms for use by the vendor in submitting its proposal. The forms required by this solicitation shall be considered mandatory, prevailing documents.

The Vendor's proposal must be written in ink or computer generated. When submitting a required Form, any corrections or erasures MUST be initialed by vendor's representative completing the bid submission. Required Forms must be complete, Bid Forms must show each required entry.

Vendors' proposal must respond to each and every requirement outlined in the RFP criteria in order to be considered responsive.

DelDOT discourages overly lengthy and costly proposals. It is the desire that proposals be prepared in a straightforward and concise manner. Unnecessarily elaborate brochures or other promotional materials beyond those sufficient to present a complete and effective proposal are not desired. DelDOT's interest is in the quality and responsiveness of the proposal.

Vendor's costs associated with participation in their response to this RFP are the vendor's responsibility.

Non-conforming proposals will not be considered. Non-conforming proposals are defined as those that do not meet the requirements of this RFP. The determination of whether an RFP requirement is substantive, or a mere formality shall reside solely with DelDOT.

3.1. COVER LETTER

Each proposal must have a cover letter on the letterhead of the company or organization submitting the proposal. The cover letter must briefly summarize the Vendor's ability to provide the services specified in the RFP. The cover letter shall be signed by an officer of the company who has the legal capacity to enter the organization into a formal contract with DelDOT.

3.2. TABLE OF CONTENTS

Each proposal must include a Table of Contents with page numbers for each of the required components of the proposal.

3.3. DESCRIPTION OF SERVICES AND QUALIFICATIONS

Each proposal must contain a detailed description of how the Vendor will provide the goods and services outlined in this RFP. This part of the proposal may also include descriptions of any enhancements or additional services or qualifications the Vendor will provide that are not mentioned in this RFP. Vendors are encouraged to review the Evaluation criteria to see how the proposals will be scored and verify that the response has sufficient documentation to support each scoring criteria identified.

3.4. PRICES QUOTED

The prices quoted are those for which the material will be furnished F.O.B. DelDOT unless otherwise specified, and include all charges that may be imposed during the period of the contract. All prices quoted must be in U.S. Dollars.

Vendors may offer to add related materiel or services that have been identified as necessary. The Vendors and DelDOT must agree on the pricing of any addition in writing.

3.5. INTERPRETATION OF ESTIMATES/QUANTITIES

Unless stated otherwise, the quantities given in the RFP are to be considered to be approximate only and are given as a basis for the comparison of bids. The Agency may increase or decrease the amount of any item as may be deemed necessary or expedient, during the period of the contract. Bidders shall recognize there are no guaranteed minimum contract quantities or values associated with this solicitation. An increase or decrease in the quantity for any item is not sufficient ground for an increase or decrease in the unit price.

3.6. NON-COLLUSION STATEMENT

Include a signed and notarized copy of the Non-Collusion Statement.
Must have original signatures and notary mark. **Use Attachment A**.

3.7. SUBCONTRACTORS

Subcontracting is permitted under this RFP and contract. Every subcontractor must be identified. Make as many copies of the form as needed. **Use Attachment B**.

3.8. BUSINESS REFERENCES

Provide at least three (3) business references consisting of current or previous customers of similar scope and value. Include business name, mailing address, contact name and phone number, number of years doing business with, and type of work performed. Personal references cannot be considered. Please provide references other than DelDOT contacts. **Use Attachment C**.

3.9. CONFIDENTIALITY FORM

Complete and include the Confidentiality Form. If your submittal includes confidential information, list on the form the confidential areas of your submittal, and follow the requirements listed. Please check box if no confidential or proprietary information is submitted. **Use Attachment D**.

3.10. EXCEPTIONS FORM

Bidders may elect to take **minor exception** to the terms and conditions of this RFP. DelDOT will evaluate each exception according to the intent of the terms and conditions contained herein. DelDOT must reject exceptions that do not conform to State bid law and/or create inequality in the treatment of bidders. Exceptions shall be considered only if they are submitted with the bid or before the date and time of the bid opening, and listed on the Exceptions form. DelDOT maintains sole discretion to reject any vendor exceptions that are submitted. **Use Attachment F**.

3.11. BROCHURES

Samples or brochures are not required for evaluation purposes. However, the Department may utilize brochures to compare and determine if the item offered complies with the intent of the specifications.

3.12. NUMBER OF PROPOSAL COPIES

To be considered, all proposals must be submitted in writing and respond to the items outlined in this RFP. The Department reserves the right to reject any non-responsive or non-conforming proposals. Each proposal must be submitted with **one original and five paper copies**. The original must be marked "Original" and must contain original signatures in all locations requiring a vendor signature. The copy must contain either original signatures or copied signatures.

Submit two (2) pdf format electronic copies (e.g. CD, flash drive) of the Proposal; one original and one redacted copy. The original must be a .pdf file of the original signed proposal as submitted and should be clearly marked "Original". The redacted copy must be a .pdf file of the original signed proposal with any proprietary or confidential information redacted, and this copy should be clearly marked as "Redacted" on the first page of the Proposal. Electronic copies are to be submitted with the printed Proposal. The electronic redacted copy is required even if the submission contains no proprietary or confidential information.

To determine what information may be considered proprietary or confidential and may be redacted from their Proposal, firms should review Delaware's Freedom of Information Regulations here; http://regulations.delaware.gov/AdminCode/title8/1400.shtml#TopOfPage. Under Delaware FOIA law, 29 Del. C, §10002(l)(2), "Trade secrets and commercial or financial information…which is of a privileged or confidential nature" are "records that shall not be deemed public" and are therefore exempt from disclosure under FOIA.

3.13. PROPOSAL SUBMISSION

Interested firms must submit the material required herein or they may not be considered for the project. Proposals must be received prior to the Submission due date and time indicated in Section 1.1 above. Proposals must be delivered in sealed envelopes and shall bear on the outside the name and address of the Vendor as well as the designation of the contract.

Facsimile and E-mail responses to this RFP are not acceptable. No response hand-delivered or otherwise will be accepted after the due date and time. It is the responsibility of the submitter to ensure the Proposal is received on time. DelDOT's time is considered the official time for determining the cut-off for accepting submissions. To be

considered, firms must submit the Proposal as set forth herein. Any variation, including additions, may negatively impact the scoring.

Proposals are to be delivered to:

Contract Administration – DOT2007
Delaware Department of Transportation
800 Bay Road
Dover, DE 19901

Should the office be closed at the time responses are due (such as an unexpected event or inclement weather) the submission due date shall be the following business day, at the time originally scheduled.

Any proposal submitted by US Mail shall be sent by either certified or registered mail. Any proposal received after the date and time deadline referenced above will not be considered and will be returned unopened. The proposing vendor bears the risk of delays in delivery.

3.16.1. EXAMINATION OF SPECIFICATIONS AND PROVISIONS

The Vendor shall carefully examine the proposal and the contract forms for the material contemplated. The Vendor shall investigate and satisfy itself as to the conditions to be encountered, quality and quantities of the material to be furnished, and the requirements of any Special Provisions in the RFP and the contract. The submission of a proposal shall be conclusive evidence that the Vendor has made examination of the aforementioned conditions.

4. PROPOSAL EVALUATION

4.1. PUBLIC OPENING OF PROPOSALS

The proposals shall be publicly opened at the time and place specified. Vendors or their authorized representatives are invited to be present.

Only the vendor's name and address will be read aloud during the bid opening process.

The contents of any proposal shall not be disclosed so as to be available to competing vendors during the negotiation process.

4.2. DISQUALIFICATION OF VENDORS

Any one or more of the following causes may be considered as sufficient for the disqualification of a vendor and the rejection of its proposal or proposals:

4.2.1. More than one proposal for the same contract from an individual, firm, or corporation under the same or different names.

4.2.2. Evidence of collusion among vendors.

4.2.3. Unsatisfactory performance record as evidenced by past experience with DelDOT or on a State of Delaware contract.

4.2.4. Any suspension or debarment of the parent company, subsidiary or individual involved with the vendor by federal, any state or any local governments within the last five (5) years.

4.2.5. If there are any unauthorized additions, interlineations, conditional or alternate bids or irregularities of any kind which may tend to make the proposal incomplete, indefinite, or ambiguous as to its meaning.

4.2.6. Non-attendance of mandatory pre-bid meetings shall be cause of disqualification.

4.2.7. If the unit prices are obviously unbalanced either in excess or below reasonable cost analysis values.

4.3. RESPONSIVENESS AND RESPONSIBILITY OF VENDOR

4.3.1. An individual proposal may be rejected for one or more of the following reasons:

4.3.1.1. The respondent to the solicitation is determined to be nonresponsive or non-responsible.
4.3.1.2. It is unacceptable.
4.3.1.3. It is otherwise not advantageous to the State.
4.3.1.4. The proposed price is unreasonable.

4.3.2. It shall be determined whether a vendor is responsible before awarding a contract. Factors to be considered in determining if a vendor is responsible include:

4.3.2.1. The vendor's financial, physical, personnel or other resources, including subcontracts.
4.3.2.2. The vendor's record of performance and integrity.
4.3.2.3. Any record regarding any suspension or debarment.
4.3.2.4. Whether the vendor is qualified legally to contract with the State.
4.3.2.5. Whether the vendor supplied all necessary information concerning its responsibility.

4.3.3. If a vendor is determined to be non-responsible or non-responsive, the vendor shall be informed in writing.

4.3.4. DelDOT reserves the right to waive minor irregularities or request additional information before determining if the Vendor is responsible and/or responsive. All Vendors will be afforded the same or similar opportunities, as necessary, and will be treated with equal regard before such determinations are finalized.

4.4. RIGHT TO CANCEL SOLICITATION

DelDOT reserves the right to cancel this solicitation at any time during the procurement process, for any reason or for no reason. DelDOT makes no commitments expressed or implied, that this process will result in a business transaction with any vendor.

This RFP does not constitute an offer by DelDOT. Vendor's participation in this process may result in DelDOT selecting your organization to engage in further discussions and negotiations toward execution of a contract. The commencement of such negotiations does not, however, signify a commitment by DelDOT to execute a contract nor to continue negotiations. DelDOT may terminate negotiations at any time and for any reason, or for no reason.

4.5. PROPOSAL EVALUATION COMMITTEE

The Selection Committee is generally comprised of representatives of DelDOT, other agency employees, and/or persons familiar with the subject matter.

4.5.1. The Committee reserves the right to:

4.5.1.1. Reject any and all proposals or portions of proposals received in response to this RFP or to make no award or issue a new RFP.
4.5.1.2. Waive or modify any information, irregularity, or inconsistency in proposals received.
4.5.1.3. Request modification to proposals from any or all vendors during the contract review and negotiation.
4.5.1.4. Negotiate any aspect of the proposal with any vendor and negotiate with more than one vendor at the same time.
4.5.1.5. Select for contract, or for negotiations, a proposal other than that with lowest costs.
4.5.1.6. Select more than one vendor pursuant to 29 Del. C. §6926. Such selections will be based on the highest rated Criteria and Scoring evaluations.

4.6. CRITERIA AND SCORING

#	**Criteria Description**:	**Points**	**Weight**
1	Vendor Pricing	1 – 10	20%
2	Firm's resources and capability to accomplish proposed work on schedule	1 – 10	20 %

3	Ability to provide the product that meets the special provisions and technical specifications	1 – 10	20 %
4	Compliance to industry and State system design standards	1 – 10	20 %
5	Warranty	1 – 10	10 %
6	Technical Support	1 – 10	10 %

Selection Committee members will assign up to the maximum number of points listed for each of the above criteria which determines individual ranking. The Department's ranking is the averaged ranking of all Committee members. Upon review of the Department's ranking the Committee will;

- Select the firm(s) with the highest Department ranking and award a contract(s); or
- Conduct negotiations with offerors who submit proposals found to be reasonably likely to be selected for award. If negotiations are held, Best and Final Offers will be requested from those offerors.

4.6.1. References

The Committee may contact any customer of the vendor, whether or not included in the vendor's reference list, and use such information in the evaluation process. Additionally, DelDOT may choose to visit existing installations of comparable systems, which may or may not include vendor personnel. If the vendor is involved in such site visits, the DelDOT will pay travel costs only for State of Delaware personnel for these visits.

5. AWARD

DelDOT reserves the right to make multiple awards, partial awards, award by types, item by item, or lump sum total, whichever may be most advantageous to the State of Delaware.

DelDOT reserves the right to waive technicalities, to reject any or all bids, or any portion thereof, to seek new proposals, to proceed to do the work otherwise, or to abandon the work, if in the judgment of DelDOT, the best interest of the State will be promoted thereby.

DelDOT will award this contract within ninety (90) days from the date of opening proposals to the most responsible and responsive vendor(s) who best meets the RFP terms and conditions, or all proposals will be rejected. A formal contract must be executed with the successful firm(s) within 20 days after award.

5.1. STATE OF DELAWARE BUSINESS LICENSE

Prior to receiving an award, the successful Vendor(s) shall either furnish DelDOT with proof of State of Delaware Business Licensure or initiate the process of application where required. An application may be requested in writing to: Division of Revenue, Carvel State Building, P.O. Box 8750, 820 N. French Street, Wilmington, DE 19899 or by telephone to one of the following numbers: 302-577-8778. http://revenue.delaware.gov/services/BusServices.shtml

Information regarding the award of this contract will be given to the Division of Revenue. Failure to comply with the State of Delaware licensing requirements may subject your organization to applicable fines and/or interest penalties.

5.2. MATERIAL VERIFICATION

Before any contract is awarded, the successful Vendor(s) may be required to furnish a complete statement of the origin, composition and manufacture of any or all of the material to be used in the contract together with such samples as may be requested for the purpose of testing.

5.3. CONTRACT IMPLEMENTATION

No order is to be shipped, or employee of the Vendor(s) is to begin any work prior to receipt of a State of Delaware Purchase Order signed by authorized representatives of the agency requesting service, properly processed through the State of Delaware Accounting Office. A Notice to Proceed may also be required prior to beginning work if directed in this RFP.

5.4. VENDOR EMERGENCY RESPONSE POINT OF CONTACT

The awarded vendor(s) shall provide the name(s), telephone, or cell phone number(s) of those individuals who can be contacted twenty four (24) hours a day, seven (7) days a week where there is a critical need for commodities or services when the Governor of the State of Delaware declares a state of emergency under the Delaware Emergency Operations Plan or in the event of a local emergency or disaster where a state governmental entity requires the services of the vendor.

In the event of a serious emergency, pandemic or disaster outside the control of the State, the State may negotiate, as may be authorized by law, emergency performance from the Contractor to address the immediate needs of the State, even if not contemplated under the original Contract or procurement. Payments are subject to appropriation and other payment terms.

5.5. WARRANTY

In addition to any warranty requirements listed or proposed, the successful Vendor(s) shall be required to extend any policy guarantee usually offered to the general public, FEDERAL, STATE, COUNTY, or MUNICIPAL governments, on material in this contract against defective material, workmanship, and performance.

5.6. PERSONNEL, EQUIPMENT AND SERVICES

The Vendor represents that it has, or will secure at its own expense, all personnel required to perform the services required under this contract.

All of the equipment and services required hereunder shall be provided by or performed by the Vendor or under its direct supervision, and all personnel, including subcontractors, engaged in the work shall be fully qualified and shall be authorized under State and local law to perform such services.

5.7. ASSIGNMENT

This contract shall not be assigned except by express prior written consent from the Agency.

5.8. SUBCONTRACTS

Subcontracting is permitted under this RFP and contract. However, every subcontractor shall be identified in the Proposal and agreed to in writing by DelDOT or as are specifically authorized in writing by the Agency during the performance of the contract. Any substitutions in or additions to such subcontractors, associates, or consultants will be subject to the prior written approval of the State.

The vendor(s) shall be responsible for compliance by the subcontractor with all terms, conditions and requirements of the RFP and with all local, State and Federal Laws. The vendor shall be liable for any noncompliance by any subcontractor. Further, nothing contained herein or in any subcontractor agreement shall be construed as creating any contractual relationship between the subcontractor and the State.

5.9. LAWS TO BE OBSERVED

The vendor is presumed to know and shall strictly comply with all Federal, State, or County laws, and City or Town ordinances and regulations in any manner affecting the conduct of the work. The Vendor shall indemnify and save harmless the State of Delaware, DelDOT, and all Officers, Agency and Servants thereof against any claim or liability arising from or based upon the violation of any such laws, ordinances, regulations, orders, or decrees whether by itself , by its employees, or by its subcontractor (s).

5.10. PERMITS AND LICENSES

All necessary permits, licenses, insurance policies, etc. required by local, State or Federal laws, shall be provided by the Vendor at its own expense.

5.11. AUDIT ACCESS TO RECORDS

The Vendor shall maintain books, records, documents, and other evidence pertaining to this Contract to the extent and in such detail as shall adequately reflect performance hereunder. The Vendor agrees to preserve and make available to the State, upon request, such records for a period of five (5) years from the date services were rendered by the Vendor. Records involving matters in litigation shall be retained for one (1) year following the termination of such litigation. The Vendor agrees to make such records available for inspection, audit, or reproduction to any official State representative in the performance of their duties under the Contract. Upon notice given to the Vendor, representatives of the State or other duly authorized State or Federal agency may inspect, monitor, and/or evaluate the cost and billing records or other material relative to this Contract. The cost of any Contract audit disallowances resulting from the examination of the Vendor's financial records will be borne by the Vendor. Reimbursement to the State for disallowances shall be drawn from the Vendor's own resources and not charged to Contract cost or cost pools indirectly charging Contract costs.

5.12. NO PRESS RELEASES OR PUBLIC DISCLOSURE

The State of Delaware reserves the right to pre-approve any news or broadcast advertising releases concerning this solicitation, the resulting contract, the work performed, or any reference to the State of Delaware or DelDOT with regard to any project or contract performance. Any such news or advertising releases pertaining to this solicitation or resulting contract shall require the prior express written permission of DelDOT.

The State will not prohibit or otherwise prevent the awarded vendor(s) from direct marketing to the State of Delaware agencies, departments, municipalities, and/or any other political subdivisions, however, the Vendor shall not use the State's seal or imply preference for the solution or goods provided.

5.13. PUBLICATION, REPRODUCTION AND USE OF MATERIAL

No material produced in whole or part under this contract shall be subject to copyright in the United States or in any other country. The State shall have unrestricted authority to publish, disclose, distribute and otherwise use, in whole or in part, any reports, data, or other materials prepared under this contract; provided, however, that the State agrees not to use any design or engineering plans prepared by the vendor for anything other than their intended purpose under this Contract. The Vendor shall have the right to publish any and all scientific findings. Appropriate acknowledgment and credit for the State's support shall be given in the publication.

5.14. CONTRACT DOCUMENTS

The executed Contract, DelDOT's Request for Proposal with Attachments and Appendices, the Purchase Order(s), and the Vendor's submitted Proposal shall be a part of and constitute the entire Agreement entered into by the State of Delaware and any Vendor. In the event there is any discrepancy between any of these contract documents, the former prevails over the latter.

6. TERMS AND CONDITIONS

6.1. VENDOR RESPONSIBILITY

The State will enter into a contract with the successful Vendor(s). The successful Vendor(s) shall be responsible for all products and services as required by this RFP whether or not the Vendor or its subcontractor provided final fulfillment of the order. Subcontractors, if any, shall be clearly identified in the Vendor's proposal, and are subject to the approval and acceptance of DelDOT.

6.2. RIGHTS AND OBLIGATIONS

The rights and obligations of each party to this agreement shall not be effective, and no party shall be bound by the terms of this agreement, unless and until a valid executed purchase order has been approved by the Secretary of Finance, and all procedures of the Department of Finance have been complied with. A separate purchase order shall

be issued for every project or order.

6.3. ORDERING PROCEDURE

Successful Vendor(s) are required to have either a local telephone number within the (302) area code, a toll free (800) number, or agree to accept collect calls. Depending on the nature and scope of the event, DelDOT and each State agency or other governmental entity shall be responsible for contacting the awarded vendor directly for all required resources. All consumables delivered by the Vendor and received by DelDOT or a State agency or other governmental entity, become the property of that State agency or entity. Orders may be accomplished by written purchase order, telephone, email, fax or computer on-line systems.

6.4. BILLING

The Vendor is required to "Bill as Shipped" to DelDOT or the respective ordering agency(s). Ordering agencies shall provide contract number, ship to and bill to address, contact name and phone number. The Vendor shall not charge a late fee that exceeds more than one percent (1%) per month, not to exceed twelve percent (12%) per annum.

Agencies will make every effort to achieve available discount opportunities under this contract. Vendors shall be required to report semi-annually opportunities to enhance the discounts achieved.

6.5. INVOICING

After the award(s) are made, DelDOT will forward their purchase orders ("P.O.") to the successful Vendor(s) in accordance with State Purchasing Procedures. The State will generate a payment voucher upon receipt of an acceptable invoice from the vendor.

6.6. METHOD OF PAYMENT

6.6.1. For each P.O. issued as part of this contract, the State will pay Vendor monthly, within thirty (30) days of receipt of the Vendor's billing, the amount which is legitimately earned by the Vendor, and supported by data and an itemized accounting of reasonable reimbursable direct non-salary costs. A current progress report of the work shall accompany each billing.

Final settlement for total payment to the Vendor will be made within thirty (30) days from the date of final written State acceptance of the work and services as agreed to in the P.O.

6.6.2. No premium time for overtime will be paid without prior written State authorization. Any indirect overhead cost shall not be applied to the premium portion of the overtime.

6.6.3. DelDOT, agencies or school districts using this award will authorize and process for payment each invoice within thirty (30) days after the date of receipt of a correct invoice. The State of Delaware intends to maximize the use of the P-Card for payment for goods and services provided under contract. Vendors shall not charge additional fees for acceptance of this payment method and shall incorporate any costs into their proposals. Additionally, there shall be no minimum or maximum limits on any P-Card transaction under the contract. While it is the State's intention to utilize the P-card payment method the State reserves, at its discretion, the right to pay by ACH/ ACI or check. Should a Vendor wish to provide a financial incentive to not process payment by P-Card in their proposal, they are to prepare their proposals to clearly outline any incentives for alternative payment methods the Vendor is willing to accept.

6.7. PRODUCT SUBSTITUTION

All items or services delivered during the life of the contract shall be of the same type and manufacture as specified or accepted as part of the proposal unless specific approval is given by the Agency to do otherwise. Awarded vendors are highly encouraged to offer any like substitute product (s), either generic or brand name, at any time during the subsequent contract term, especially if an opportunity for cost savings to the state exists. In all cases, the state may require the submission of written specifications and/or product samples for evaluation prior to any approvals being granted.

6.8. CHANGES

Both parties may, from time to time, require changes in the services to be provided by the Vendor under the Scope of Work. Such changes, including any increase or decrease in the amount of the Vendor's compensation, which are mutually agreed upon by and between the Agency and the Vendor shall be incorporated in written amendments to the Purchase Order or contract.

6.9. SCHEDULE FOR PERFORMANCE OF WORK

All work described in these specifications shall be completed with reasonable promptness. As used in this Section, the State of Delaware shall be the sole judge of the term "reasonable". If the Vendor does not begin the work in a reasonable amount of time, they will be notified that if they fail to initiate the work promptly, the contract may be terminated and the State will forthwith proceed to collect for nonperformance of work.

6.10. VENDOR- OWNED EQUIPMENT REMOVAL

The awarded Vendor shall remove all rental equipment and supplies from the event location (s) no later than an agreed to date once all contract obligations by the Vendor have been met.

6.11. CONTRACT EXTENSION

DelDOT reserves the right to extend this contract on a month-to-month basis for a period of up to three months.

6.12. LAWS OF DELAWARE

This Agreement and the terms thereof shall be construed in accordance with the laws of the State of Delaware. In addition, Vendor(s) agrees to the jurisdiction and venue of a competent court within the State of Delaware.

7. GENERAL PROVISIONS

7.1. AUTHORITY OF AGENCY

On all questions concerning the interpretation of specifications, the acceptability and quality of material furnished and/or work performed, the classification of material, the execution of the work, and the determination of payment due or to become due, the decision of DelDOT or the Agency shall be final and binding.

7.2. FUNDING OUT or NON-APPROPRIATION

In the event the General Assembly fails to appropriate the specific funds necessary to enter into or continue the contractual agreement, in whole or part, the agreement shall be terminated as to any obligation of the State requiring the expenditure of money for which no specific appropriation is available at the end of the last fiscal year for which no appropriation is available or upon the exhaustion of funds.

7.3. INDEPENDENT CONTRACTORS

The parties to any contract from this solicitation shall be independent contractors to one another, and nothing herein shall be deemed to cause the agreement to create an agency, partnership, joint venture or employment relationship between parties. Each party shall be responsible for compliance with all applicable workers compensation, unemployment, disability insurance, social security withholding and all other similar matters. Neither party shall be liable for any debts, accounts, obligations or other liability whatsoever of the other party or any other obligation of the other party to pay on the behalf of its employees or to withhold from any compensation paid to such employees any social benefits, workers compensation insurance premiums or any income or other similar taxes.

7.4. TEMPORARY PERSONNEL ARE NOT STATE EMPLOYEES

Vendor agrees that any individual or group of temporary staff person(s) provided to the State of Delaware pursuant to this Solicitation shall remain the employee(s) of Vendor for all purposes including any required compliance with the Affordable Care Act by the Vendor. Vendor agrees that it shall not allege, argue, or take any position that individual temporary staff person(s) provided to the State pursuant to this Solicitation must be provided any benefits, including

any healthcare benefits by the State of Delaware and Vendor agrees to assume the total and complete responsibility for the provision of any healthcare benefits required by the Affordable Care Act to aforesaid individual temporary staff person(s). In the event that the Internal Revenue Service, or any other third party governmental entity determines that the State of Delaware is a dual employer or the sole employer of any individual temporary staff person(s) provided to the State of Delaware pursuant to this Solicitation, Vendor agrees to hold harmless, indemnify, and defend the State to the maximum extent of any liability to the State arising out of such determinations.

Notwithstanding the content of the preceding paragraph, should the State of Delaware subsequently directly hire any individual temporary staff employee(s) provided pursuant to this Solicitation, the aforementioned obligations to hold harmless, indemnify, and defend the State of Delaware shall cease and terminate for the period following the date of hire. Nothing herein shall be deemed to terminate the Vendor's obligation to hold harmless, indemnify, and defend the State of Delaware for any liability that arises out of compliance with the ACA prior to the date of hire by the State of Delaware. Vendor will waive any separation fee provided an employee works for both the vendor and hiring agency, continuously, for a three (3) month period and is provided thirty (30) days written notice of intent to hire from the agency. Notice can be issued at second month if it is the State's intention to hire.

7.5. EMERGENCY TERMINATION OF CONTRACT

7.5.1. Due to restrictions which may be established by the United States Government on material, or work, a contract may be terminated by the cancellation of all or portions of the contract.

7.5.2. In the event the Vendor is unable to obtain the material required to complete the items of work included in the contract because of restrictions established by the United States Government and if, in the opinion of the Agency, it is impractical to substitute other available material, or the work cannot be completed within a reasonable time, the incomplete portions of the work may be cancelled, or the contract may be terminated.

7.6. INDEMNIFICATION

7.6.1. General Indemnification

By submitting a proposal, the proposing vendor agrees that in the event it is awarded a contract, it will indemnify and otherwise hold harmless the State of Delaware, its agents and employees from any and all liability, suits, actions, or claims, together with all costs, expenses for attorney's fees, arising out of the vendor's its agents and employees' performance work or services in connection with the contract.

7.6.2. Proprietary Rights Indemnification

Vendor shall warrant that all elements of its solution, including all equipment, software, documentation, services and deliverables, do not and will not infringe upon or violate any patent, copyright, trade secret or other proprietary rights of any third party. In the event of any claim, suit or action by any third party against the State of Delaware, the State of Delaware shall promptly notify the vendor in writing and vendor shall defend such claim, suit or action at vendor's expense, and vendor shall indemnify the State of Delaware against any loss, cost, damage, expense or liability arising out of such claim, suit or action (including, without limitation, litigation costs, lost employee time, and counsel fees) whether or not such claim, suit or action is successful.

If any equipment, software, services (including methods) products or other intellectual property used or furnished by the vendor (collectively ""Products") is or in vendor's reasonable judgment is likely to be, held to constitute an infringing product, vendor shall at its expense and option either:

7.6.2.1. Procure the right for the State of Delaware to continue using the Product(s);

7.6.2.2. Replace the product with a non-infringing equivalent that satisfies all the requirements of the contract; or

7.6.2.3. Modify the Product(s) to make it or them non-infringing, provided that the modification does not materially alter the functionality or efficacy of the product or cause the Product(s) or any part of the work to fail to conform to the requirements of the Contract, or only alters the Product(s) to a degree that the State of Delaware agrees to and accepts in writing.

7.7. NON-PERFORMANCE

In the event the Vendor does not fulfill its obligations under the terms and conditions of this contract, in addition to proceeding with termination of the contract, the ordering agency may terminate any individual orders in accordance with General Provisions, Item titled as "TERMINATION OF INDIVIDUAL PURCHASE ORDERS" below and

purchase equivalent product on the open market. Regarding any such open market purchase, payment for any difference in cost or expense in excess of the contract prices for reasonably equivalent products or services herein shall be the responsibility of the Vendor and shall be submitted to the State no later than 30 days following the delivery of the State's invoice detailing the open market purchase. Under no circumstances shall monies be due the Vendor in the event open market products can be obtained below contract cost. Any monies charged to the Vendor may be deducted from an open invoice.

7.8. FORCE MAJEURE

Neither the vendor nor the ordering agency shall be held liable for non-performance under the terms and conditions of this contract due, but not limited to, government restriction, strike, flood, fire, or unforeseen catastrophe beyond either party's control. Each party shall notify the other in writing of any situation that may prevent performance under the terms and conditions of this contract.

7.9. VENDOR NON-ENTITLEMENT

State of Delaware Vendors for Materiel and for Services shall not have legal entitlement to utilize any Central Contract held by the State of Delaware. The Vendors may not seek business from another Vendors' Central Contract for the purpose of preparing a bid or proposal to the State of Delaware. Additionally, they shall not utilize other Central Contracts to fulfill the requirements of their respective contract unless they are considered a "Covered Agency" as defined by Title 29 Chapter 69 of the State Procurement Code or otherwise permitted by law.

This is not a prohibition from any Vendor choosing to work with another Vendor who holds a State Central Contract for private business.

7.10. TERMINATION OF INDIVIDUAL ORDERS OR PURCHASE ORDERS

The individual orders may be terminated as follows:

7.10.1. **Termination for Cause**: If, for any reasons, or through any cause, the Vendor fails to fulfill in timely and proper manner his obligations, or if the Vendor violates any of the covenants, agreements, or stipulations of this contract, the Agency shall have the right to terminate the P.O. by giving written notice to the Vendor of such termination and specifying the effective date thereof, at least five (5) days before the effective date of such termination. In that event, all finished or unfinished documents, data, studies, surveys, drawings, maps, models, photographs, and reports or other material prepared by the Vendor in the performance of the P.O. shall, at the option of the Agency, become its property, and the Vendor shall be entitled to receive just and equitable compensation for any satisfactory work completed on such documents and other materials which is usable to the Agency.

7.10.2. **Termination for Convenience**: The Agency may terminate the P.O. at any time by giving written notice of such termination and specifying the effective date thereof, at least sixty (60) days before the effective date of such termination. In that event, all finished or unfinished documents, data, studies, surveys, drawings, models, photographs, reports, supplies, and other materials shall, at the option of the department, become its property and the Vendor shall be entitled to receive compensation for any satisfactory work completed on such documents and other materials which are usable to the Agency.

7.10.3. **Termination for Non-Appropriations**: In the event the General Assembly fails to appropriate the specific funds necessary to enter into or continue the contractual agreement, in whole or part, the agreement shall be terminated as to any obligation of the State requiring the expenditure of money for which no specific appropriation is available at the end of the last fiscal year for which no appropriation is available or upon the exhaustion of funds. This is not a termination for convenience and will not be converted to such.

7.11. TERMINATION OF CONTRACT

The contract awarded as a result of this RFP may be terminated as follows by DelDOT.

7.11.1. **Termination for Cause**: If, for any reasons, or through any cause, the Vendor fails to fulfill in timely and proper manner its obligations under this Contract, or if the Vendor violates any of the covenants, agreements, or stipulations of this Contract, the State shall thereupon have the right to terminate this contract by giving written notice to the Vendor of such termination and specifying the effective date thereof, at least thirty (30) days before the effective date of such termination. In that event, all finished or unfinished documents, data, studies, surveys, drawings, maps, models, photographs, and reports or other material prepared by the Vendor

under this Contract shall, at the option of the State, become its property, and the Vendor shall be entitled to receive just and equitable compensation for any satisfactory work completed on such documents and other materials which is usable to the State.

On receipt of the contract cancellation notice from the State, the Vendor shall have not less than five (5) days to provide a written response and may identify a method(s) to resolve the violation(s). A vendor response shall not effect or prevent the contract cancellation unless the State provides a written acceptance of the vendor response. If the State does accept the Vendor's method and/or action plan to correct the identified deficiencies, the State will define the time by which the Vendor must fulfill its corrective obligations. Final retraction of the State's termination for cause will only occur after the Vendor successfully rectifies the original violation(s). At its discretion the State may reject in writing the Vendor's proposed action plan and proceed with the original contract cancellation timeline.

7.11.2. **Termination for Convenience**: The State may terminate this Contract at any time by giving written notice of such termination and specifying the effective date thereof, at least sixty (60) days before the effective date of such termination. In that event, all finished or unfinished documents, data, studies, surveys, drawings, models, photographs, reports, supplies, and other materials shall, at the option of the State, become its property and the Vendor shall be entitled to receive compensation for any satisfactory work completed on such documents and other materials, and which is usable to the State.

7.11.3. **Termination for Non-Appropriations**: In the event the General Assembly fails to appropriate the specific funds necessary to enter into or continue the contractual agreement, in whole or part, the agreement shall be terminated as to any obligation of the State requiring the expenditure of money for which no specific appropriation is available at the end of the last fiscal year for which no appropriation is available or upon the exhaustion of funds. This is not a termination for convenience and will not be converted to such.

7.12. PUBLIC INSPECTION OF PROPOSALS

All documents submitted as part of the vendor's proposal will be deemed confidential during the evaluation process. Vendor proposals will not be available for review by anyone other than the State of Delaware/Proposal Evaluation Committee or its designated agents. There shall be no disclosure of any vendor's information to a competing vendor prior to award of the contract.

The State of Delaware is a public agency as defined by state law, and as such, it is subject to the Delaware Freedom of Information Act, 29 Del. C. Ch. 100. Under the law, all the State of Delaware's records are public records (unless otherwise declared by law to be confidential) and are subject to inspection and copying by any person. Vendor(s) are advised that once a proposal is received by the State of Delaware and a decision on contract award is made, its contents will become public record and nothing contained in the proposal will be deemed to be confidential except proprietary information.

Vendor(s) shall not include any information in their proposal that is proprietary in nature or that they would not want to be released to the public. Proposals must contain sufficient information to be evaluated and a contract written without reference to any proprietary information. If a vendor feels that they cannot submit their proposal without including proprietary information, they must adhere to the following procedure or their proposal may be deemed unresponsive and will not be recommended for selection. Vendor(s) must submit such information in a separate, sealed envelope labeled "Proprietary Information" with the RFP number. The envelope must contain a letter from the Vendor's legal counsel describing the documents in the envelope, representing in good faith that the information in each document is not "public record" as defined by 29 Del. C. § 10002(d), and briefly stating the reasons that each document meets the said definitions.

Upon receipt of a proposal accompanied by such a separate, sealed envelope, the State of Delaware will open the envelope to determine whether the procedure described above has been followed.

7.13. TAX EXEMPTION

7.13.1. Material covered by this proposal is exempt from all FEDERAL and STATE TAXES. Such taxes shall not be included in prices quoted.

7.13.2. Any material which is to be incorporated in the work or any equipment required for the work contemplated in the proposal may be consigned to the Agency. If the shipping papers show clearly that any such material

is so consigned, the shipment will be exempt from the tax on the transportation of property under provisions of Section 3475 (b) of the Internal Revenue Code, as amended by Public Law 180 (78th Congress). All transportation charges shall be paid by the Vendor. Each Vendor shall take its exemption into account in calculating its bid for its work.

7.14. AGENCY USE CONTRACT

Pursuant to 29 Del. C. §6904(e) respectively, if no state contract exists for a certain good or service, covered agencies may procure that certain good or service under another agency's contract so long as the arrangement is agreeable to all parties. Agencies, other than covered agencies, may also procure such goods or services under another agency's contract when the arrangement is agreeable to all parties.

7.15. SILENCE OF SPECIFICATIONS

The apparent silence of the specifications as to any detail, or the apparent omission from it of detailed description concerning any point, shall be regarded as meaning that only the best commercial practice is to prevail and only material and workmanship of the first quality are to be used. Proof of specifications compliance will be the responsibility of the vendor.

7.16. APPLICABLE LAW AND JURISDICTION

This bid, any resulting contract, and any and all litigation or other disputes arising therefrom, in connection with, or related hereto shall be governed by the applicable laws, regulations and rules of evidence of the State of Delaware. Bidder submits to personal jurisdiction in the State of Delaware. Any and all litigation or other disputes arising out of, in connection with, or relating to this bid, and any resulting contract, shall be brought exclusively in a court in the State of Delaware or the United States District Court of the District of Delaware as applicable.

7.17. SEVERABILITY

If any term or provision of this Agreement is found by a court of competent jurisdiction to be invalid, illegal or otherwise unenforceable, the same shall not affect the other terms or provisions hereof or the whole of this Agreement, but such term or provision shall be deemed modified to the extent necessary in the court's opinion to render such term or provision enforceable, and the rights and obligations of the parties shall be construed and enforced accordingly, preserving to the fullest permissible extent the intent and agreements of the parties herein set forth.

7.18. PATENTED DEVICES, MATERIAL AND PROCESSES

7.18.1. The Vendor shall provide for the use of any patented design, device, material, or process to be used or furnished under this contract by suitable legal agreement with the patentee or owner, and shall file a copy of this agreement with the Agency.

7.18.2. The Vendor and the surety shall hold and save harmless the State of Delaware, the Agency, the Director, their Officers or Agents from any and all claims because of the use of such patented design, device, material, or process in connection with the work agreed to be performed under this contract.

7.19. INTEREST OF VENDOR

The vendor covenants that it presently has no interest and shall not acquire any interest, direct or indirect, which would conflict in any manner or degree in providing products or performing services required under this contract. The vendor further covenants, that in the performance of this contract, no person having any such interest shall be employed.

7.20. ASSIGNMENT OF ANTITRUST CLAIMS

As consideration for the award and execution of this contract by the State, the Vendor hereby grants, conveys, sells, assigns, and transfers to the State of Delaware all of its right, title and interest in and to all known or unknown causes of action it presently has or may now or hereafter acquire under the antitrust laws of the United States and the State of Delaware, regarding the specific goods or services purchased or acquired for the State pursuant to this contract. Upon either the State's or the Vendor notice of the filing of or reasonable likelihood of filing of an action under the antitrust laws of the United States or the State of Delaware, the State and Vendor shall meet and confer about coordination of representation in such action.

7.21. TESTING AND INSPECTION

The State of Delaware reserves the right to conduct any test or inspection it may deem necessary to ensure equipment, materials and services conform to contract requirements.

7.22. COVENANT AGAINST CONTINGENT FEES

The Vendor warrants that no person or selling agency has been employed or retained to solicit or secure this contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees. For breach or violation of this warranty, the State shall have the right to annul this contract without liability or in its discretion to deduct from the contract price or consideration, or otherwise recover, the full amount of such commission, percentage, brokerage, or contingent fees.

7.23. GRATUITIES

7.23.1. If it is found, after notice and hearing, by the State that gratuities (in the form of entertainment, gifts, or otherwise) were offered or given by the Vendor or any agent of the State with a view toward securing a contract, or securing favorable treatment with respect to the awarding, amending, or the making of any determinations with respect to the performance of this contract, the State may, by written notice to the Vendor, terminate the right of the Vendor to proceed under this contract and/or may pursue such other rights and remedies provided by law or under this agreement; provided that the existence of the facts upon which the State makes such findings shall be in issue and may be reviewed in proceedings pursuant to the Remedies clause of this contract; and

7.23.2. In the event this contract is terminated pursuant to subparagraph "a", the State shall be entitled (i) to pursue the same remedies against the Vendor, and (ii) to exemplary damages, as a penalty in addition to any other damages to which it may be entitled by law, in an amount which shall be not less than three, nor more than ten, times the costs incurred by the Vendor in providing any such gratuities to any such officer or employee. The amount of such exemplary damages shall be in the sole discretion of the State.

7.24. POTENTIAL CONTRACT OVERLAP

Vendors shall be advised that the State, at its sole discretion, shall retain the right to solicit for goods and/or services as required by its agencies and as it serves the best interest of the State. As needs are identified, there may exist instances where contract deliverables, and/or goods or services to be solicited and subsequently awarded, overlap previous awards. The State reserves the right to reject any or all bids in whole or in part, to make partial awards, to award to multiple vendors during the same period, to award by types, on a zone-by-zone basis or on an item-by-item or lump sum basis item by item, or lump sum total, whichever may be most advantageous to the State of Delaware.

7.25. SUPPLEMENTAL SOLICITATION

The State reserves the right to advertise a supplemental solicitation during the term of the Agreement if deemed in the best interest of the State.

7.26. REQUIRED REPORTING

One of the primary goals in administering this contract is to keep accurate records regarding its actual value/usage. This information is essential in order to update the contents of the contract and to establish proper bonding levels, if they are required. The integrity of future contracts revolves around our ability to convey accurate and realistic information to all interested parties.

A complete and accurate Usage Report (**Attachment 8**) shall be furnished in an Excel format and submitted electronically, no later than the 15th (or next business day after the 15th day) of each month, detailing the purchasing of all items and/or services on this contract. The reports shall be completed in Excel format, using the template provided, and submitted as an attachment to vendorusage@state.de.us, with a copy going to the contract officer identified as your point of contact. Submitted reports shall cover the full month (Report due by January 15th will cover the period of December 1 – 31.), contain accurate descriptions of the products, goods or services procured, purchasing agency information, quantities procured, and prices paid. Reports are required monthly, including those with "no spend". Any exception to this mandatory requirement or failure to submit complete reports, or in the format required, may result in corrective action, up to and including the possible cancellation of the award. Failure to provide the report with the minimum required information may also negate any contract

extension clauses. Additionally, Vendors who are determined to be in default of this mandatory report requirement may have such conduct considered against them, in assessment of responsibility, in the evaluation of future proposals.

In accordance with Executive Order 44, the State of Delaware is committed to supporting its diverse business industry and population. The successful Vendor will be required to accurately report on the participation by Diversity Suppliers which includes: minority (MBE), woman (WBE), veteran owned business (VOBE), or service disabled veteran owned business (SDVOBE) under this awarded contract. The reported data elements shall include but not be limited to; name of state contract/project, the name of the Diversity Supplier, Diversity Supplier contact information (phone, email), type of product or service provided by the Diversity Supplier and any minority, women, veteran, or service disabled veteran certifications for the subcontractor (State OSD certification, Minority Supplier Development Council, Women's Business Enterprise Council, VetBiz.gov). The format used for Subcontracting 2nd Tier reporting is shown as Attachment 9.

Accurate 2nd Tier reports shall be submitted to the contracting Agency's Office of Supplier Diversity at vendorusage@delaware.gov on the 15th (or next business day) of the month following each quarterly period. For consistency quarters shall be considered to end the last day of March, June, September and December of each calendar year. Contract spend during the covered periods shall result in a report even if the contract has expired by the report due date.

7.27. FAIR BACKGROUND CHECK PRACTICES

Pursuant to 29 Del. C. §6909B, the State does not consider the criminal record, criminal history, credit history or credit score of an applicant for state employment during the initial application process unless otherwise required by state and/or federal law. Vendors doing business with the State are encouraged to adopt fair background check practices. Vendors can refer to 19 Del. C. §711(g) for applicable established provisions.

7.28. EQUALITY OF EMPLOYMENT OPPORTUNITY ON PUBLIC WORKS

During the performance of any contract for public works financed in whole or in part by appropriation of the State of Delaware, the contractor agrees as follows:

7.28.1. The contractor, as set forth in Title 19 Delaware Code Chapter 7 section 711, will not discriminate against any employee or applicant for employment with respect to compensation, terms, conditions or privileges of employment because of such individual's race, marital status, genetic information, color, age, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed and that employees are treated equally during employment without regard to their race, marital status, genetic information, color, age, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following: advertising, lay-off or termination, rates of pay or other forms of compensation, and selection for training including apprenticeships. The contractor agrees to post in conspicuous places, notices to be provided by the contracting agency setting forth the provisions of this non-discrimination clause.

7.28.2. During the performance of this contract, the contractor agrees as follows:

7.28.2.1. The contractor, as set forth in Title 19 Delaware Code Chapter 7 section 711, will not discriminate against any individual with respect to compensation, terms, conditions or privileges of employment because of such individual's race, marital status, genetic information, color, age, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take positive steps to ensure that applicants are employed and that employees are treated during employment without regard to their race, marital status, genetic information, color, age, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places available to employees and applicants for employment notices to be provided by the contracting agency setting forth this nondiscrimination clause.

7.28.2.2. The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without

regard to race, marital status, genetic information, color, age, religion, sex, sexual orientation, gender identity, or national origin."

The term "contractor for public works" means construction, reconstruction, demolition, alteration, and/or repair work, maintenance work, and paid for in whole or in part out of the funds of a public body except work performed under a vocational rehabilitation program. The manufacture or furnishing of materials, articles, supplies or equipment is not a public work within the meaning of this subsection unless conducted in connection with and at the site of the public work.

7.29. ENVIRONMENTAL PROCUREMENT REQUIREMENTS

Energy Star - If applicable, the Vendor must provide products that earn the ENERGY STAR rating and meet the ENERGY STAR specifications for energy efficiency in order to keep overall event costs to a minimum. The Vendor is encouraged to visit www.energystar.gov for complete product specifications and updated lists of qualifying products. Green Products – third party certification of green products accepted from GSS w/approved green certification shall be offered wherever available in addition to or as a substitute for non-green products.
Vendors shall report all green items procured during the monthly reporting period using the Usage Report that will be provided to the awarded Vendor(s).

Environmental Procurement Policies of the State shall determine acceptable consideration and credit for environmentally preferred products and services in the performance of this award. The State Environmental Procurement Policies may be found: Environmentally Preferred Purchasing Policy

7.30. VENDOR BACKGROUND CHECK REQUIREMENTS

Vendor(s) selected for an award that access state property or come in contact with vulnerable populations, including children and youth, shall be required to complete background checks on employees serving the State's on premises contracts. Unless otherwise directed, at a minimum, this shall include a check of the following registry:

- Delaware Sex Offender Central Registry at: https://sexoffender.dsp.delaware.gov/

Individuals that are listed in the registry shall be prevented from direct contact in the service of an awarded state contract, but may provide support or off-site premises service for contract vendors. Should an individual be identified and the Vendor(s) believes their employee's service does not represent a conflict with this requirement, may apply for a waiver to the primary agency listed in the solicitation. The Agency's decision to allow or deny access to any individual identified on a registry database is final and at the Agency's sole discretion.

By Agency request, the Vendor(s) shall provide a list of all employees serving an awarded contract, and certify adherence to the background check requirement. Individual(s) found in the central registry in violation of the terms stated, shall be immediately prevented from a return to state property in service of a contract award. A violation of this condition represents a violation of the contract terms and conditions, and may subject the Vendor to penalty, including contract cancellation for cause.

Individual contracts may require additional background checks and/or security clearance(s), depending on the nature of the services to be provided or locations accessed, but any other requirements shall be stated in the contract scope of work or be a matter of common law. The Vendor(s) shall be responsible for the background check requirements of any authorized Subcontractor providing service to the Agency's contract.

7.31. DRUG TESTING REQUIREMENTS FOR LARGE PUBLIC WORKS

Pursuant to 29 Del.C. §6908(a)(6), effective as of January 1, 2016, OMB has established regulations that require Contractors and Subcontractors to implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds. The regulations establish the mechanism, standards and requirements of a Mandatory Drug Testing Program that will be incorporated by reference into all Large Public Works Contracts awarded pursuant to 29 Del.C. §6962.
Final publication of the identified regulations can be found at the following:

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects

7.32. MINIMUM WAGE RATES

Work performed under this solicitation may fall under the State of Delaware Minimum Wage Rates

7.33. IRS 1075 Publication (only if applicable to IT procurements)

Performance

In performance of this contract, the Contractor agrees to comply with and assume responsibility for compliance by his or her employees with the following requirements:

All work will be performed under the supervision of the contractor or the contractor's responsible employees.
The contractor and the contractor's employees with access to or who use FTI must meet the background check requirements defined in IRS Publication 1075.

Any Federal tax returns or Federal tax return information (hereafter referred to as returns or return information) made available shall be used only for the purpose of carrying out the provisions of this contract. Information contained in such material shall be treated as confidential and shall not be divulged or made known in any manner to any person except as may be necessary in the performance of this contract. Inspection by or disclosure to anyone other than an officer or employee of the contractor is prohibited.

All returns and return information will be accounted for upon receipt and properly stored before, during, and after processing. In addition, all related output and products will be given the same level of protection as required for the source material.

No work involving returns and return information furnished under this contract will be subcontracted without prior written approval of the IRS.

The contractor will maintain a list of employees authorized access. Such list will be provided to the agency and, upon request, to the IRS reviewing office.

The agency will have the right to void the contract if the contractor fails to provide the safeguards described above.
Criminal/Civil Sanctions

Each officer or employee of any person to whom returns or return information is or may be disclosed shall be notified in writing by such person that returns or return information disclosed to such officer or employee can be used only for a purpose and to the extent authorized herein, and that further disclosure of any such returns or return information for a purpose or to an extent unauthorized herein constitutes a felony punishable upon conviction by a fine of as much as $5,000 or imprisonment for as long as five years, or both, together with the costs of prosecution. Such person shall also notify each such officer and employee that any such unauthorized future disclosure of returns or return information may also result in an award of civil damages against the officer or employee in an amount not less than $1,000 with respect to each instance of unauthorized disclosure. These penalties are prescribed by IRCs 7213 and 7431 and set forth at 26 CFR 301.6103(n)-1.

Each officer or employee of any person to whom returns or return information is or may be disclosed shall be notified in writing by such person that any return or return information made available in any format shall be used only for the purpose of carrying out the provisions of this contract. Information contained in such material shall be treated as confidential and shall not be divulged or made known in any manner to any person except as may be necessary in the performance of this contract. Inspection by or disclosure to anyone without an official need-to-know constitutes a criminal misdemeanor punishable upon conviction by a fine of as much as $1,000.00 or imprisonment for as long as 1 year, or both, together with the costs of prosecution. Such person shall also notify each such officer and employee that any such unauthorized inspection or disclosure of returns or return information may also result in an award of civil damages against the officer or employee [United States for Federal employees] in an amount equal to the sum of the greater of $1,000.00 for each act of unauthorized inspection or disclosure with respect to which such defendant is found liable or the sum of the actual damages sustained by the plaintiff as a result of such unauthorized inspection or disclosure plus in the case of a willful inspection or disclosure which is the result of gross negligence, punitive damages, plus the costs of the action. The penalties are prescribed by IRCs 7213A and 7431 and set forth at 26 CFR 301.6103(n)-1.

Additionally, it is incumbent upon the contractor to inform its officers and employees of the penalties for improper disclosure imposed by the Privacy Act of 1974, 5 U.S.C. 552a. Specifically, 5 U.S.C. 552a(i)(1), which is made applicable to contractors by 5 U.S.C. 552a(m)(1), provides that any officer or employee of a contractor, who by virtue of his/her employment or official position, has possession of or access to agency records which contain individually identifiable information, the disclosure of which is prohibited by the Privacy Act or regulations established thereunder, and who knowing that disclosure of the specific material is so prohibited, willfully

discloses the material in any manner to any person or agency not entitled to receive it, shall be guilty of a misdemeanor and fined not more than $5,000.

Granting a contractor access to FTI must be preceded by certifying that each individual understands the agency's security policy and procedures for safeguarding IRS information. Contractors must maintain their authorization to access FTI through annual recertification. The initial certification and recertification must be documented and placed in the agency's files for review. As part of the certification and at least annually afterwards, contractors must be advised of the provisions of IRCs 7431, 7213, and 7213A (see Exhibit 4, Sanctions for Unauthorized Disclosure, and Exhibit 5, Civil Damages for Unauthorized Disclosure). The training provided before the initial certification and annually thereafter must also cover the incident response policy and procedure for reporting unauthorized disclosures and data breaches. (See Section 10) For both the initial certification and the annual certification, the contractor must sign, either with ink or electronic signature, a confidentiality statement certifying their understanding of the security requirements.

Inspection

The IRS and the Agency, with 24 hour notice, shall have the right to send its inspectors into the offices and plants of the contractor to inspect facilities and operations performing any work with FTI under this contract for compliance with requirements defined in IRS Publication 1075. The IRS' right of inspection shall include the use of manual and/or automated scanning tools to perform compliance and vulnerability assessments of information technology (IT) assets that access, store, process or transmit FTI. On the basis of such inspection, corrective actions may be required in cases where the contractor is found to be noncompliant with contract safeguards.

8. DEFINITIONS

The attached Definitions apply to this Request for Proposal. The requirement to furnish a bid bond and performance bond is applicable unless waived. Vendors or their authorized representatives are required to fully acquaint themselves as to State procurement laws and regulations prior to submitting a proposal.

Whenever the following terms are used, their intent and meaning shall be interpreted as follows:

STATE: The State of Delaware

AGENCY: Delaware Department of Transportation (DelDOT).

BID INVITATION: The "Request for Proposal" is a packet of material sent to vendors and consists of related documents and enclosures.

BOND: The approved form of security furnished by the Vendors and its surety as a guaranty of good faith on the part of the Vendor to execute the work in accordance with the terms of the contract.

CONTRACT: The written agreement covering the furnishing and delivery of material or work to be performed.

DESIGNATED OFFICIAL: The agent authorized to act for an Agency.

GENERAL PROVISIONS: General Provisions are instructions pertaining to contracts in general. They contain, in summary, requirements of laws of the State, policies of the Agency, and instructions to vendors.

LOCAL TIME: Eastern Standard Time/Eastern Daylight Time.

PROPOSAL: The offer of the Vendor submitted on the approved form(s) and setting forth the Vendor's offer and prices for performing the work or supplying the material or equipment described in the specifications.

RFP: Request for Proposal.

SPECIAL PROVISIONS: Special Provisions are specific conditions or requirements peculiar to the contract under consideration and are supplemental to the General Provisions. Should the Special Provisions conflict with the General Provisions, the Special Provisions shall prevail.

SURETY: The corporate body which is bound with and for the contract, or which is liable, and which engages to be responsible for the Vendor's payments of all debts pertaining to and for its acceptable performance of the work for which he has contracted

VENDOR: Any individual, firm, or corporation formally submitting a proposal for the material or work contemplated, acting directly or through a duly authorized representative.

VENDOR'S DEPOSIT: The security designated in the proposal to be furnished by the Vendor as a guaranty of good faith to enter into a contract with the Agency if the work to be performed or the material or equipment to be furnished is awarded to it.

9. TECHNICAL SPECIFICATIONS:

9.0 Reliability and Operational Stability

The vendor shall furnish all necessary equipment inclusive of all parts and components necessary to be a completely operational Portable Dynamic Message Sign (PDMS) System, unless stated otherwise in these specifications. Compliance with the Specifications pertaining to individual elements of the PDMS System does not in itself constitute compliance with the reliability and long-term operational stability of the complete PDMS System.

9.1 Materials

The Bidder shall include in the bid price, all cables and incidental items necessary for complete operation of each PDMS System.

All hardware furnished by the vendor shall be new and of recent manufacture; no used or refurbished hardware is allowed. Firmware and software must be tested and in working order; prototype firmware or software will not be permitted.

The vendor shall register with the manufacturer(s) all equipment, firmware, and software in the name of the Department. Electronic Copies of the registration forms shall be forwarded to the Department.
The vendor shall store and handle all materials and equipment in a clean, dry location, free of construction dust, precipitation and excess moisture in such a manner as not to degrade quality, serviceability, or appearance. This storage environment shall be adhered to but not limited to delivery holding areas and assembly areas.

9.2 Materials and Fabrication

All equipment and component parts furnished shall be new, be of the latest design, recent manufacture, and in operable condition at the time of delivery. No part or attachment shall be substituted or applied contrary to the manufacturer's recommendations and standard practices. All equipment is to be procured from a manufacturer or manufacturers who have been engaged in the manufacture of such equipment for a period of five (5) years or more. Submit certifications from the various manufacturers that ensure essential equipment provided will be carried in factory stock for a period of at least ten (10) years.

All materials for the PDMS System shall be new, corrosion resistant, and unaffected by water spray salt, oil, gasoline, and all other contaminants in the quantities normally found along the edge of the roadway. The PDMS System construction, materials, and operations shall conform to all National Electric Code (NEC) and National Fire Protection Association (NFPA) standards.

All electronic equipment shall be of solid-state design and modular construction. Individual electronic modules shall provide easy service access and shall be field replaceable. The design shall be such as to prevent incorrect assembly or installation of connectors, fasteners, etc., where possible malfunction or personnel hazards might occur. Each item of equipment shall be designed to protect personnel from exposure to high voltage during equipment operation, adjustments and maintenance.

The PDMS System and all associated control and electronics equipment, and enclosures shall be designed for outdoor installation. All environmental testing shall be successfully performed prior to delivery of the PDMS System and/or associated equipment. If requested by the Department, the vendor shall supply manufacturer and/or third party certification for equipment. Provide all equipment to operate in a range of -35 Degrees F to +120 Degrees F at a relative humidity not exceeding 99%, non-condensing, unless otherwise specified.

The design life of the PDMS, including all sign components, operating 24 hours per day, shall be at least 10 years within the environmental conditions as specified. The vendor shall deliver to the Department a list containing the manufacturer certified design life for all PDMS components provided.

All electrical materials and equipment used for which there are established Underwriters Laboratories (UL) and Electrical Testing Laboratories (ETL) standards shall bear the UL and ETL labels.

9.3 Regulations and Codes

All electrical equipment shall conform to the standards of National Electrical Manufacturers Association (NEMA), National Electric Safety Council (NESC), National Fire Protection Agency (NFPA), Federal Communications Commission (FCC), and the Electronic Industries Association/Telecommunications Industry Association (EIA/TIA) where applicable.

All system wiring, conduit, grounding hardware, and circuit breakers shall be in conformance with the issue of the National Electrical Code (NEC) in effect on the date of the bid. All electrical conductors shall be copper.
All roadside trailers, vehicles, and poles on which PDMS are mounted must be in compliance with the 2016 edition of the Manual for Assessing Safety Hardware (MASH).

Otherwise, whenever references are made in these provisions, they are considered to mean the code, ordinance or standard that is in effect at the time of the bid advertisement.

9.4 Quality Assurance

The vendor shall develop a Quality Control Program and submit it to the Department for review and approval within twenty (20) working days after the issuance of the Notice to Proceed. The vendor shall be required to resubmit a Quality Control Program that has been rejected by the Department within seven (7) days for approval, unless otherwise noted. The vendor shall follow the approved quality control program for the duration of the Contract. The vendor shall not deliver any equipment prior to the approval of the Quality Control Program. At a minimum, the Quality Control Program must include:

a) The Project Manager and Technical Lead, along with any other key staff, as well as their responsibilities.
b) A description of the manufacturing facility and process used to ensure delivery of equipment consistent with this Contract and Specifications.
c) Standard Delivery time following receipt of a Purchase Order from the Department.

9.5 Modifications to Submitted Equipment

The vendor shall provide updated design documentation for any PDMS System Component that has changed from what was originally submitted in response to this RFP for Department review and approval prior to delivery. The vendor shall provide an advanced warning, in writing, if modifications to a particular PDMS System component will require a change in spare parts inventory. Any new PDMS system that becomes available during the life of this agreement, that meets or exceeds these specifications, can be negotiated between the vendor and Department and added as a new PDMS type.

9.6 User Manuals and System Administrator Documents

The vendor shall provide operator user manuals sufficient to describe how the system can be deployed, operated, and maintained.

The vendor shall provide manuals for the system administrator sufficient to describe how the system can be administered, including setup, installation, configuration, testing, and maintenance.

Separate Manuals and Administrator Documentation shall be provided for each of the PDMS Systems as specified.

10.0 Warranty

The vendor shall extend to the Department a policy guarantee on equipment and/or services against defective material and workmanship for a period of at least two (2) years from the date of delivery. Vendors are encouraged to provide extended warranty plans with their bid.

Any item that is normally covered by the warranty policy but is determined to have been damaged through misuse or neglect shall be exempt from coverage. If any part of the unit is normally covered by a warranty policy for more than one year, the full period of warranty policy of that component shall be provided to the Department. The vendor shall be solely responsible for the warranty of equipment by others, but provided by the Contractor as part of this Contract including parts and labor for removal and replacement of failed components.

The vendor shall comply with the manufacturer's warranty or authorize a qualified dealer in the locality in which the PDMS System is delivered to do whatever is required to comply with the manufacturer's warranty without cost to the Department. When warranty work is required, the Department shall notify the vendor and/or their designated maintenance facility/provider. Upon notification that warranty work is required, the vendor shall be required to respond either by telephone, email, or in person within five (5) business days after notification by the Department. If the Department and the vendor determine that an on-site visit is necessary, the vendor shall provide the necessary labor force (technicians) within five (5) working days after notification by the Department to perform the necessary repairs. If the provision of replacement parts is required to perform the repair work, affecting the five (5) day response time, the vendor is to immediately notify the Department and provide a corresponding timetable. The vendor shall bear the cost of transporting materials and equipment to/from the work site as well as all labor required to make the repair. All replacement parts shall be newly manufactured and provide a direct replacement for the existing component to be replaced.

During the warranty period, the vendor is responsible for providing the software and/or firmware upgrades to provided equipment.

Within the warranty period, the Department reserves the right to require the replacement of portions of the whole PDMS System at no additional cost under the following circumstances:

a) If one particular component fails more than three (3) times on the same devices within a period of six (6) months.
b) If two or more different components fail more than a combined number of four (4) times on the same device within a period of six (6) months.

The Department shall have the right to request an extension of the warranty period beyond the initial offering for one (1) or more PDMS device(s) the additional warranty can be negotiated and agreed upon between both the Department and the vendor.

11.0 Spare Parts

The Bidder shall submit with their bid, a list and price of recommended spare parts for all PDMS Systems including all associated equipment, software, and other components that provide for a fully functional PDMS System. All spare parts shall be identical to the installed components and to enable the Department or its agent to readily replace defective components. The Department may review the suggested minimum stocked spare parts and cost estimates, and modify/negotiate the terms with the Bidder on those items.

The Department expects recommended spare part catalogs to include, but not be limited to:

- Sign Controllers
- Portable Display Face
- LED Display Module(s)
- LED Display Module Driver(s)
- Power Supplies
- Photoelectric Sensor(s)

- Temperature Sensor(s)
- Air Filters
- Tires
- Cable/Winch Mechanism spare parts

Spare parts required shall be calculated on an estimated number of PDMS as follows:

- Six (6) purchased complete Type 1 PDMS,
- Six (6) purchased complete Type 2 PDMS.
- Six (6) purchased complete Type 3 PDMS

The Department will be responsible for the provision of all spare parts related to the communication on PDMS devices and central TMC software.

All spare parts provided shall be newly manufactured and identical to originally suppled equipment. If original replacement parts are no longer available, all spare parts shall be a direct replacement for the originally installed equipment.

The spare parts shall be provided as a complete assembly with all items necessary for replacement. The spare part replacement should not require any uncommon tools; however, if uncommon tools are necessary, they must be provided along with the spare part components.

The vendor shall be required to provide spare parts to the Department within fifteen (15) working days after receipt of an approved purchase order throughout the duration of the Contract, including any contract extensions.
For the duration of the Contract, if the vendor or Manufacturer discontinues or improves upon any spare part or equipment, the vendor shall submit an updated spare parts list to the Department, including the price for each item. Pricing for any replacement spare parts or equipment shall be similar to that originally submitted.

12.0 Integration

All PDMS systems are to be controlled through the Department's Advanced Traffic Management Software (ATMS), Q-Free Open TMS, located in the Transportation Management Center (TMC) in Smyrna, DE. The proposer shall coordinate with the Department and the Department's software vendor (Q-Free), to aid in the connection and integration of provided PDMS.

The proposer will also make available their PDMS control and diagnostic software to the Department for use in localized installations and any event that issues arise with the ATMS.

13.0 Acceptance Testing

The Vendor shall develop an Acceptance Test Plan (ATP) to ensure that each feature is fully operational and fulfills any and all requirements of the Project Specifications. The ATP shall be broken down into test scripts, each of which shall clearly identify the requirements defined in these Project Specifications, and they are to be addressed by a particular test script. The test scripts shall test only logically connected requirements, otherwise a new test script shall be defined to address requirements not logically connected. For example, a test script demonstrating the functionality associated with automatic dimming shall not also attempt to demonstrate the legibility distance requirements.

The Plan shall be submitted to the TMC Manager for review and approval within forty-five (45) working days after issuance of NTP. The TMC Manager may review and respond in writing on the submitted ATP within fifteen (15) business days from the date of receipt of the submission (NOTE: this includes the ATP for any modified PDMS type/models purchased later in the project via an individual Purchase Order). The Contractor shall be required to resubmit any revisions requested by The TMC Manager to the ATP to be fully compliant with the requirements of the Contract within fifteen (15) business days for approval, unless otherwise noted by The TMC Manager. The Contractor shall clearly note any deviations, changes, additions, or other modifications.

The ATP shall cover all equipment items and shall include the following individual tests:

1. Factory Acceptance Test
2. Communication System Test
3. Unit Test
4. Final Acceptance Test

Reports and records of each test and each inspection must be submitted for approval. The original results are to contain the original forms filled out by the persons performing the inspection/tests, and the original signatures. Forms are to be filled out in ink. Errors are to be crossed out with a single line and initialed by the person making the correction. Include a cover letter signed by the project manager with each set of inspection/test results.

Include the following in each set of test results:

1. The completed set of procedures used.
2. The completed, signed set of forms used including serial/lot numbers of individual equipment.
3. A summary of the test performed.

Each submitted test procedure is to include, at a minimum:

1. Unique Title
2. The purpose of the test to be conducted, including reference to the corresponding test plan requirements, and functions covered by the procedures.
3. Specified design and performance requirements.
4. Cases and conditions covered by the test procedures.
5. Testing/measuring equipment and/or tools to be utilized.
6. Testing configuration/setup instructions
7. Step-by-step instructions for performing the procedure including where data is to be recorded.
8. Expected test results including minimum and maximum thresholds if required.

Test forms are to be provided as integral components to the testing procedure for all equipment except in the case of individual components that do not warrant the need for a comprehensive testing procedure. For all other forms, the following is required:

1. Test title, requirements to be tested, and procedures
2. Test date and the name/signature of the person conducting the test.
3. Manufacturer and model number of all test equipment.
4. Calibration data and standard for each piece of testing equipment (if required), certified by a recognized testing facility.

Upon receipt of completed test forms and procedures, the Department will compare the test results with the requirements specified herein. Failure to conform to the requirements of any test will be considered defective and equipment will be subject to rejection by the Department. In the event that the defect is determined, the vendor shall analyze and categorize all defects as to whether they are limited to the specific unit being tested or could potentially cause problems in all such units. Tests that are rejected for not meeting requirements, but limited to a specific unit may be offered again for retest by the vendor providing all non-conforming items have been corrected.

The Department reserves the right to witness, in person, any test being conducted by the vendor.

The acceptance of each stage of testing does not absolve the vendor of their responsibilities under Section 2.0 Warranty. If sufficient issues are encountered during a test phase, the department may require the vendor to return to a previous testing phase for any component or the complete system. If, through testing/re-testing of devices, the system identifies a common failure pattern, the vendor will be required to replace similar equipment or systems within all provided devices.

13.1 Factory Acceptance Testing

It is anticipated that the majority of equipment being provided under this contract will be standard, off-the-shelf having certification of compliance with industry-accepted standards that also meet the technical requirements

for each device type. Conduct FAT in accordance with the documentation provided in response to this RFP for each device type proposed upon in the presence of Department Personnel at the vendor's facility. It should be noted that in-person FAT will only be required once for each device type to be supplied. Upon successful FAT for the first of each device type, completed FAT checklists will be accepted in lieu of viewing FAT in person.

13.2 Unit Testing

Upon request by The Department through a purchase order, the manufacturer shall provide one (1) unit of each item for testing.

1. The equipment submitted by the Vendor shall be complete will all components called for as per the specifications. The Department will not initiate the evaluation of the equipment until all components are provided and the portable PDMS device is complete as per the specifications and ready for testing/evaluation. No partial submittals of the equipment shall be permitted.
2. The technical evaluation by The Department will be for a period of forty-five (45) calendar days.
3. If the device submitted fails to perform for the complete 45-day period, the Contractor will be notified by The Department, at which time, the Vendor shall make necessary repairs within seven (7) calendar days at no expense to The Department.
4. The Department will have sole discretion in determining if there is substantial need to re-initialize or "restart" the evaluation period after repairs are performed by the Contractor.
5. If the device fails three (3) times, as identified by The Department, the device will be disqualified from further consideration for the current Contract. All devices not meeting these requirements will be considered a non- compliance device and removed from the facility. No Department employee will be required to make any modifications for the manufacturer/Vendor to the device while being evaluated.
6. The equipment will be physically examined by The Department TMC Manager or authorized representative to determine compliance with the specifications
7. PDMS Units will be fully charged when delivered.
8. PDMS Photovoltaic panels will be disconnected from the battery source.
9. PDMS Units will be required to satisfactorily operate a 21-day continuous burn period at maximum output.
10. PDMS Units will operate at its brightest intensity during daytime hours, and shall dim automatically 50% during nighttime hours.

13.3 Final Acceptance Testing

The final acceptance test shall commence after delivery of the equipment and will be performed for each delivered PDMS. The TMC Manager shall inform the Vendor in writing whether the PDMS has passed the acceptance test. Additionally, each PDMS shall be exposed to a final acceptance test period of thirty (30) days. In the event of a malfunction, the final acceptance test period shall be terminated. The Vendor shall respond to malfunctions within 24 hours of identification and notification by the TMC Manager. The Vendor shall be responsible for restoring systems, sub-systems, or sub-system components to a fully functional and operational order within five (5) calendar days from the notification at no additional cost to The Department. Failure to do so shall extend the final acceptance test period by an amount equal to the period that the equipment is malfunctioning beyond the specified five (5) calendar days. However, the 30-day test period shall be re-started from the test day that the PDMS failed.

To accommodate unusual circumstances, a written request for an extension of the five (5) day response period with justification shall be forwarded to the TMC Manager for approval. Delivery time for replacement parts shall not be accepted as justification for an unusual circumstance. The replacement of any item or part shall result in the complete re-testing of the appropriate on-site stand-alone tests at no additional cost to The Department.

The Department will NOT accept the device unless a certificate of origin and proper invoicing materials for the trailer mounted PDMS is provided and delivered to The Department, for EACH delivered PDMS.

14.0 Training

The vendor shall submit a system training plan to the Department within thirty (30) days of Notice to Proceed. Once the training plan is approved, the vendor shall use it to provide formal system training for up to fifteen (15) Department staff, on site at the Department's chosen location. The Department will be responsible for scheduling training activities

and identifying staff to be trained This work is to provide the Department's personnel and/or representatives with operations, maintenance, replacement techniques, and support training program including courseware, material, and services for the entire PDMS System. The vendor shall provide copies of all training materials for each person being trained.

The Department may review and respond in writing on all submitted training plans within fifteen (15) days from submission. The vendor shall be required to resubmit training plans rejected by the Department within fifteen (15) days from the return of the original submittal unless otherwise noted. The vendor shall clearly note any changes, deviations, or other modifications on the resubmittal.

The vendor shall provide training on the proper installation, assembly, testing, disassembly, uninstallation, transportation, handling, operation, maintenance, support, replacement, and safety of the operations for the complete PDMS System.

The training requirements defined herein shall consist of, but not be limited to, furnishing all labor, materials, and transportation for the planning, organizing, and executing of training. The vendor shall provide an instructor at a location of the Department's choice to conduct training courses.

The vendor shall be responsible for updating all training materials if the PDMS System has been upgraded or modified in any way during the duration of the Contract.

14.1 Maintenance Training Requirements

The purpose of this training is to provide Department employees as well as others a training course in the operation, circuit description, preventative maintenance procedures, troubleshooting, field adjustments, and/or calibration and repair/replacement of PDMS equipment. At a minimum, Maintenance Training shall include the following:

1. Review of basic system configuration and operation
2. Review of preventative maintenance procedures
3. Review of system and software troubleshooting procedures
4. Replacement of component parts
5. Theory of operation
6. Calibration, alignment, and adjustment procedures for equipment
7. Device and cabinet wiring
8. Complete schematics and sub-component part listing

14.2 Operations Training Requirements

The purpose of this training is to provide Department employees as well as others with a training course in the day-to-day operation of the PDMS System and its capabilities. At a minimum, Operation Training shall include the following:

1. Equipment handling/transporting
2. System installation
3. System assembly and disassembly
4. System testing
5. Dynamic Message Sign equipment
6. Controller
7. Power supply
8. Firmware
9. Communications
10. Vendor software
11. Safety procedures
12. Basic operational procedures
13. System, firmware, and vendor software troubleshooting

15.0 Technical Assistance

The vendor shall provide manufacturer-authorized service center staff to provide technical assistance and telephone support as-needed during normal business hours. The vendor shall provide phone numbers that can be contacted for this purpose.

In the event technical assistance is needed, the vendor shall make available a vendor-certified technical resource within 48 hours from the Department placing a call. Technical assistance shall include the installation, assembly, testing, disassembly, un-installation, operation, maintenance, and replacement of PDMS Systems. Technical assistance must be provided during the entire duration of the Contract, including any extensions. Technical resources shall be knowledgeable in the following at a minimum:

1. All provided PDMS equipment
2. PDMS System Controller(s)
3. Electrical and Communications equipment and software
4. PDMS System Housings and environmental controls
5. PDMS System Power Supply including solar panels and batteries
6. Switchover from AC to solar/battery power.
7. PDMS Trailer

16.0 NTCIP Conformance

All PDMS and associated control equipment shall comply with the latest versions of the National Transportation Communication for ITS Protocol (NTCIP) Standards, as follows:

1. NTCIP 1101:1996 (v01.12, December 2001) – Simple Transportation Management Framework.
2. NTCIP 1103 v03 (December 2016) – Transportation Management Protocols (TMP).
3. NTCIP 1201 (v03, March 2011) – Global Objects (GO) Definitions.
4. NTCIP 1203 (v03, September 2014) –Object Definitions for Dynamic Message Signs (PDMS).
5. NTCIP 2101:2001 (v01.19, November 26, 2001) – Point to Multi-Point Protocol Using RS-232 Subnetwork Profile.
6. NTCIP 2103 (v02, December 2008) – Point-to-Point Protocol over RS-232 Subnetwork Profile.
7. NTCIP 2104:2003 (v01.11, September 2005) – Ethernet Subnetwork Profile.
8. NTCIP 2201:2003 (v01.15, September 2005) – Transportation Transport Profile.
9. NTCIP 2202:2001 (v01.05, December 2001) – Internet (TCP/IP and UDP/IP) Transport Profile.
10. NTCIP 2301 (v02.19s, October 2010) – Simple Transportation Management Framework (STMF) Application Profile (AP) (AP-STMF).

Furnish all mandatory objects specified by the NTCIP specifications and all other objects, both NTCIP optional and the manufacturer specific, that are required to provide the functionality to meet the requirements of these specifications.
Each PDMS Component shall support the Full, Standardized Object Range (FSOR) of all objects required by these procurement specifications, unless otherwise indicated or approved by the Department or its Representative.
The PDMS system shall not require the support of any agency-specific or manufacturer-specific objects. However, the Proposer shall propose any object definitions necessary to fulfill the above functional requirements that are not addressable by standardized NTCIP-defined object definitions. All functional requirements and the corresponding NTCIP objects have been carefully reviewed and only functions that have corresponding NTCIP objects have been selected. Manufacturer-specific objects may be implemented in the sign controller, but they shall in no way required to be used in order to communicate with the sign.

The PDMS shall support all mandatory objects of all mandatory Conformance Groups as defined in NTCIP 1201 and NTCIP 1203 and their amendments.

The NTCIP Component shall also implement all mandatory objects of the following optional conformance groups:

1. Time Management, as defined in NTCIP 1201.
2. Timebase Event Schedule, as defined in NTCIP 1201.
3. In the event of a conflict between the Specifications and Standards, the Department or its Representative shall be solely responsible for the identification of the acceptable solution.

17.0 Portable Dynamic Message Sign – Type 1 – Freeway, Full Matrix, Amber

17.1 General

Design and Furnish a Light Emitting Diode (LED) Portable Dynamic Message Sign (PDMS) providing a full matrix amber display for traveler information and freeway work zone applications. The PDMS matrix shall be sized sufficient to provide display of three (3) lines of eight (8) characters, with a nominal character size of 18 inches in a standard 5x7 font, with a minimum of four (4) LEDs per pixel.

17.2 Sign Panel Enclosure

Provide a PDMS for mounting to the PDMS trailer frame. The enclosure shall be of such design and shape as to house all necessary LED display module, display driver, power and control equipment.
Provide an enclosure that is weatherproof to protect the interior components from water, dust, dirt, corrosion and any other foreign objects.

The enclosure is to be constructed of corrosion resistant aluminum material conforming to the following:

1. Sheet aluminum shall be fabricated from aluminum alloy sheet meeting the requirements of ASTM B 209, Alloy 5052, Temper H3, or equivalent, minimum .125 inch thick.
2. Cast aluminum shall be fabricated from aluminum alloy meeting the requirements of ASTM B 686, Alloy A 356 (A 13560) or equivalent. Flat cast surfaces exceeding 12 inches in both directions shall have a minimum thickness of 0.25 inches. Flat cast surfaces not exceeding 12 inches in both directions shall have a minimum thickness of 0.187 inches.
3. All PDMS enclosures shall meet the requirements for TYPE 3R enclosures according to NEMA Standard Publication 250. All seams and openings shall be designed to prevent entry of water resulting from high pressure washing of the LED PDMS enclosure.
4. Unpainted aluminum PDMS enclosures shall be fabricated from mill-finish material and shall be cleaned using appropriate methods that will remove oil, film, weld black, and mill ink marks and render the surface clean, bright, smooth and non-sticky to touch.
5. Corrosion protection shall be provided between dissimilar metals by isolating them.
6. Vendors that do not manufacture an aluminum enclosure may propose a powder coated steel enclosure, meeting the requirements of NEMA TS 4-2005 and for TYPE 3R enclosures according to NEMA Standard Publication 250 that meets or exceeds the corrosion resistance requirements of the aluminum enclosures specified herein.

All welds shall be continuously welded. All corners and seams shall be professionally welded to provide a weatherproof seal around the entire case and to ensure that the housing is structurally sound. Welds using heli-arc, gas metal arc, gas tungsten arc and plasma arc welding processes, all allowable for aluminum welding, are acceptable.

All visible surfaces shall have a maintenance free protective treatment and/or paint coating with a design life of 10 years, minimum. The sign panel housing shall be painted or powder-coated Highway Safety Orange in conformance with Federal Standard 595b, Color No. 12443 on the sides and back. The front sign face shall be flat back in accordance with Federal Standard 595b, Color No. 37030.

All nuts and bolts used in the PDMS assembly shall be stainless steel. All connecting surfaces shall be weatherproof and watertight when secured. All internal components shall be mounted so that there are no external protrusions. Forged rings shall be provided for moving and positioning of the extendable sign housing.

Appropriate precautions, such as heating elements or ventilation fans or openings, shall be taken to ensure that condensation does not occur between the matrix elements and the PDMS face, and that the environment inside all enclosures remains within the temperature and humidity limits required for proper operation of the sign's electronic components.

The dead load shall consist of the total weight as installed of the PDMS enclosure and appurtenances. The point of application of weights of the individual items shall be their representative centers of gravity.

Ice load shall be as per AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries, and Traffic Signals except that ice load shall be applied to all sides and top surfaces of the PDMS enclosure simultaneously.

Wind load shall be as per AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals except as modified herein. The enclosure and their mountings shall withstand a sustained wind speed of 90 miles per hour (mph), with a gust factor of 1.3 when using the four 27" outriggers (see Trailer Specifications).

Drain holes shall be provided and designed to remove any condensation that may form inside the PDMS enclosure and allow any water that may have collected in the housing to escape. All holes shall be screened to prevent small objects, insects, and creatures from entering into the enclosure.

Border around the sign housing (referred to as 'legend' in NTCIP terms) on all four edges shall be within a range of 6 to 12 inches.

Locks for all PDMS enclosures shall be of a type to be approved by The Department.

The enclosure shall have one or more lockable sign access cover latches and interior housing lighting that turns on when the sign access cover(s) is/are opened and that turns off when the sign access cover(s) is/are closed.
The controller cabinet shall provide a keyboard storage location. The keyboard shall be secured so that it is held securely in place during transport.

The controller cabinet shall be watertight to avoid that the sign controller, the keyboard, or any other sensitive equipment is exposed to any water or other particles that might negatively affect their operation.

Removal of any of the display modules or any other electronic or electrical component, shall not alter the structural integrity of the PDMS display assembly or the PDMS enclosure.

The Vendor shall submit fabrication and shop drawings and design calculations for all PDMS enclosures, ventilation, and mounting, sealed by a Professional Engineer licensed in the state(s) where the sign(s) is to be installed.

17.3 Display Face

Provide a sign face that complies with Federal Specification TT-E-489. Equip the sign display with a shatter-resistant cover that is optically clear, high impact, scratch resistant, low glare, and ultraviolet stabilized polycarbonate plastic (i.e., Lexan with stabilizer or approved equal) of not less than 3/16 of an inch in thickness and is manufactured from virgin materials by a major manufacturer. Covers containing recycled materials are unacceptable.

The pigmentation of the polycarbonate and its optical characteristics shall be matched to the wavelength of the LED's to guarantee the transmission of at least 80% of the light emitted, as certified by the polycarbonate manufacturer. The PDMS face cover shall be ultraviolet (UV) inhibiting, providing a minimum reduction of 80% of both UV type A and UV type B light that reaches the LED's, as certified by the polycarbonate manufacturer.
The cover is to be of sufficient thickness and strength to withstand cleaning, installation, removal, sign vibration, and negative/positive pressure loading due to atmospheric wind as well as pressures created by the passage of large trucks.

Where possible, the display face cover shall be one continuous sheet. Multiple sections with seams shall only be acceptable where the size of the sign will not allow for the installation of one continuous sheet, and only with the

approval of the Department. The number of seams shall be kept to a minimum. Seams shall be water-tight, transparent and shall not obscure the viewing of the displayed message by oncoming traffic.

The display face cover shall be field replaceable with common hand tools and lifting equipment, if required, in less than four (4) hours. Removal of any combination of sign face windows shall not alter the structural integrity of the sign display cover nor the sign.

The display face cover shall be anti-glare and positioned to minimize glare effects. It shall have a light transmission degradation that is less than 10% from the original for ten years. This shall be measured by determining the light transgression when the sign is provided and measuring it yearly. If the light transgression is greater than 10% within the time frame specified above, the PDMS sign face cover shall be replaced at no cost to the Department.

Attachment of all sign face windows shall utilize a reusable gasket for weatherproofing. The usable life of all gaskets shall be at least ten (10) years. Gasketing shall be closed cell neoprene, permanently bonded to the metal. The mating surfaces of the gasketing shall be covered with a silicon lubricant to prevent sticking. The lubricant used shall not degrade the neoprene over time. The attachment mechanism for all sign face covers allows the cover material to expand and contract (due to temperature fluctuations) yet retain a weatherproof seal.

17.4 Sign Mounting

The structural support framework shall allow the system to be assembled into a unit and be mounted on the trailer, and shall provide the support mechanism between the sign panel assembly, the power supply, and the controller. The framework shall provide sufficient support to prevent damage to any PDMS components when the sign is in the down and locked position during normal highway travel up to 70 mph.

Provide an accessible mechanism to easily raise and lower the display assembly. Provide a locking device to lock the display panel in the raised or lowered position. Provide a single metal telescoping mast pole to mount the PDMS that is integral to the body of the trailer. Provide a support capable of adjusting the height of the sign and allowing the sign to rotate 360 degrees around the vertical axis of the mast pole, without requiring more than a single operator to perform height or angle adjustments. Equip locking mechanisms that allow the PDMS to be locked in position at any angle of rotation. Provide the ability to elevate the center point of the sign face to a minimum height of 10 feet above ground level. The sign mast and locking mechanisms shall allow complete sign operation including raising, lowering, and rotating the sign during maximum sustained wind speeds of 90 mph with a gust factor of 1.3.

17.5 Sign Display

The LEDs that make up the display modules shall be high luminous intensity T-1 3/4" type manufactured by a reputable manufacturer. The LEDs shall have an ultraviolet light inhibitor in the epoxy dome package and be of a production type already tested for use in high vibration commercial traffic environments and climate of the mid-Atlantic United States.

Each PDMS LED module shall be comprised of Amber LEDs that meet AlInGaP semiconductor technology that has a peak wavelength of 588-592nm.

All LEDs shall have a nominal viewing cone of 30 degrees with a half-power angle of 15 degrees measured from the longitudinal axis of the LED.

The LEDs shall be rated by the LED manufacturer to have a minimum lifetime of 100,000 hours of continuous operation while maintaining a minimum of 70% of the original brightness.

The LEDs used in the display shall be obtained from batches sorted for luminous output, where the highest luminosity LED in the batch shall not be more than fifty percent more luminous than the lowest luminosity LED in the batch when operated at the manufacturer’s recommended drive current. To ensure uniformity of display and operational life, all LEDs used to make up a display module shall be obtained from the same manufacturing batch.

The LED manufacturer shall perform intensity sorting of the bins. LEDs shall be obtained from no more than two (2) consecutive luminous intensity “bins” as defined by the LED manufacturer.

The LED manufacturer shall perform color sorting of the bins. LEDs shall be obtained from no more than two (2) consecutive color “bins” as defined by the LED manufacturer.

The LED mean time before failure (MTBF) shall be a minimum of 100,000 hours of elapsed time calendar hours use in an ambient temperature of 131 degrees Fahrenheit, based on an average daily on-time usage factor of 50%, when driven at the specific forward current recommended by the LED manufacturer for normal daylight PDMS display operation. As part of the LED manufacturer's technical specification sheet submittal, the specific forward current shall be noted.

The statistical average long term light output degradation of the LEDs used in the display, operated at the LED manufacturer’s recommended drive current to achieve a minimum of 100,000 hours of operation without catastrophic failure in an ambient temperature of 131 degrees Fahrenheit, shall not exceed the following:

1. A maximum of 10% reduction in light output after 10,000 hours of continuous on time.
2. A maximum of 25% reduction in light output after 50,000 hours of continuous on time.
3. A maximum of 30% reduction in light output after 100,000 hours of continuous on-time.
4. Manufacturer’s documentation for high temperature operating life (HTOL) shall indicate if HTOL values are based upon actual or extrapolated data.

The LED display modules shall have a minimum refresh rate of 60 times per second to prevent visible flicker.

The LEDs shall be grouped in pixels consisting of discrete LEDs arranged in a continuous matrix display with individual pixel addressability. The centers of all pixels shall be arranged so as to maintain the same horizontal and vertical spacing between adjacent pixels. All pixels shall be replaceable. The LED grouping and mounting angle shall be optimized for maximum readability.

The electronics for the PDMS shall be fully configured to drive the total required number of LEDs. The failure of any one pixel shall not affect the operation of any other pixel. The power driver circuitry shall be designed to minimize power consumption. Each LED display module shall have a diagnostic capability to detect a failure on the LED display module, down to the pixel level and report the failure to the PDMS controller.

Removal of any display module shall not affect the operation of the remaining modules.

The LED modules shall be protected from degradation due to sunlight. The method used shall not obstruct the view of the display or reduce the viewing angle below that provided by an unprotected LED module. The method and design of the PDMS sunlight protection shall be approved by the Department.

All PDMS must be capable of meeting or exceeding the Manual of Uniform Traffic Control Devices (MUTCD) guidelines for inter-character and inter-line spacing of 25% and 50% of character height, respectively.

The 18” character shall be clearly visible and legible from in-vehicle distance of 720 feet from the PDMS face under clear daylight and nighttime conditions with the PDMS face positioned in the roadway line of sight.
The PDMS shall have a photocell controlled dimming circuit which shall automatically adjust the luminance of the LED display pixels in accordance with ambient light conditions. As part of the Proposer's submittal, a complete schematic of the LED display power, driver and dimming circuits shall be provided for approval by the Department.

17.6 Sign Controller

Equip each PDMS with a sign controller that contains all the necessary hardware and software to control the sign. The controller is to be a compact unit with no dimension greater than 19” as mounted on the trailer and be located for easy access.

The PDMS controller shall:

1. Be solid-state and removable
2. Be able to generate and store messages.
    a. Provide ability to generate two-phase messages including text and MUTCD compliant graphics.
    b. Provide ability to store up to fifty (50) messages locally.
3. Include an LCD display screen upon which messages can be reviewed before display on the message sign
4. Have a keyboard that shall:
    a. Allow operator to access, generate, and store messages in the controller.
    b. Have tactile feedback (a membrane-type keyboard is not acceptable).
    c. In lieu of a keyboard, a hand-held terminal may be used.
5. Be able to conduct automatic system recovery after communications outages to the central controller without operator intervention.
6. Be able to be controlled from one or more remote units. The controller shall be able to:
    a. Accept a message for display.
    b. Restart or sequence a display mode operation with currently stored RAM messages.
7. Have an RS-232 port to facilitate connection of an external communication device.
8. Be able to monitor and display the status of the photocell and adjust the sign illumination to match the ambient light conditions.
    a. With each DMS display and controller, the Contractor shall furnish and install a system which shall detect the background ambient light level and provide a minimum of eight adjustable ambient light input levels.
    b. The controller shall have adjustable levels of light output from 10% to 100% brightness in 5% increments.
    c. Dimming shall be implemented with a mechanism such as high frequency variation of the display duty cycle (pulse width modulation) in order to minimize any detrimental flickering.
    d. The dimming system shall conform to the requirements stated in NEMA TS4-2005, Section 8.8 plus the following additional requirements (which are stricter than those stated in TS4):
        i. Photo-Electric Sensors - The dimming system shall contain a minimum of three commercially available photo-electric sensors.
        ii. The photo-electric sensors shall be placed so that they detect the ambient light levels striking the top, front, and rear of each sign.
        iii. Dimming Levels - Manual and automatic dimming modes shall be provided, enabling the user to select the desired mode of operation.
        iv. The dimming system shall select a minimum of one of eight levels from the detected ambient light. The set points for each of the eight ambient light levels shall be set within user adjustable software.
        v. Manual dimming shall be accomplished locally and remotely.
            1. Local control shall be with a laptop computer connected to the port furnished in the field controller.
            2. Remote control shall be achieved by calling the field controller with the central or remote computers.
        vi. The photo- electric system shall be capable of distinguishing between fog and nighttime light inputs.
            1. The dimming system shall be pre-programmed so that, if fog is present, over bright light output is turned on.
            2. If nighttime light input is detected, the dimming system shall be pre-programmed to output reduced light output.
        vii. If either the upstream facing sensor or the downstream facing sensor's reading is greater than the day limit, the over bright level of pixel luminance shall be used; otherwise the daytime level shall be used.
        viii. In case of luminance control system failure, the luminance level shall be designed to default to the night level.

ix. The controller shall automatically report any luminance/brightness failures to the control computer.

e. All light sensors shall be located in an easily accessible location for maintenance.
   i. All light sensors shall be mounted in a way that permits adjustment of the aiming angle.
   ii. For sign structures containing more than one LED DMS unit, one set of three light sensors shall be used per structure.

9. Provide a calendar program within the controller that enables to automatically start and stop the display of messages at predetermined times.
   a. These scheduled messages shall work even when communication to the TMC is lost.
   b. The scheduled messaged shall be able to be programmed both locally and remotely.
10. Provide a reporting mechanism that stores all events such as the actual times and dates when a message was displayed, where is originated (scheduler, manual local, manual central), any failures including communications failures, power failures, and any recoveries from failures.
11. Provide for the controller to be queried to check the display for pixel failures and to report the failures.
12. Report the ambient temperature and the sign housing temperature.
13. Monitor and display the battery output voltage and solar array activities (charging/discharging).
    a. The controller shall blank the sign when the output voltage drops below the manufacturer's recommended output level. In this case, the controller software automatically switches the trailer to a minimum power mode to preserve batteries.
    b. The PDMS shall use the DMS Power Loss Message data element to achieve this functionality. Note: while this is a slight bending of the actual definition of the DMS Power Loss Message data element, the intent of this parameter is still fulfilled (the power is theoretically insufficient to display the message)

17.7 Trailer

The trailer shall conform to Delaware Law governing trailers. The trailer shall be primed and painted or powder-coated Highway Safety Orange in conformance with Federal Standard 595b, Color N. 12243.

All equipment covers and storage boxes shall have a locking mechanism for security. All locks (Pad Locks and Locking Handles) for any and all units purchased under this contract shall be keyed the same for the life of the contract. The Transportable Trailer shall meet the following requirements:

1. Maximum Dimensions:
   a. Length: 122 inches nominal. The length of the trailer shall conform to Delaware Law governing trailers and shall be transportable utilizing a vehicle with a load rating no greater than 3/4 ton.
   b. Width: maximum of 96 inches overall
   c. Travel height shall not exceed 112 inches
   d. Operating height shall not exceed 204 inches
2. Materials utilized shall conform to NEMA TS4-2016
3. Sign Panel Mast:
   a. The lift mechanism shall be an electric or electrically-assisted hydraulic mechanism able to raise and lower the sign panel.
   b. The mechanism shall have a manual pump jack mechanism able to raise and lower the sign panel in case of failure of the hydraulic jack.
   c. A safety bolt, hot dipped galvanized in accordance with ASTM A153 or made of stainless steel, shall be provided to prevent the sign panel from lowering once in the raised position. A self-locking mechanism shall be incorporated into the safety bolt that prevents it from being inadvertently dislodged.
   d. The lift mechanism shall allow the raised sign panel to rotate 360 degrees about the vertical axis.
      i. Rotation shall be possible in either a clockwise or counter-clockwise direction.
      ii. A locking mechanism shall be provided to prevent rotation of the sign panel assembly once the sign panel is in place, at any position.

e. Provide ability to mount a pan-tilt-zoom CCTV camera to the top of the Sign Panel Mast including mounting hardware. CCTV camera devices to be provided by the Department.

4. Battery Box utilized shall conform to NEMA TS4 plus the following requirements:
    a. #14 Gauge Steel, Hinged Telescoping Door Support
    b. Battery Lock Down Assembly
5. Mechanical requirements shall conform to NEMA TS4 plus the following requirements:
    a. Provide extendable Stabilizers: Four 27" adjustable outriggers
    b. Hitch: Tow Ready Adjustable Lunette Ring with Channel
        i. Compatible with all pintle hooks
        ii. Two inch ball
        iii. Heavy Duty Design
        iv. Forged Alloy Steel with a black powder coat finish
        v. Inner diameter: 3 inches
        vi. Outside diameter: 6 inches
        vii. Capacity: 12,000 GTW
    c. Roller Bearings: Yes
    d. Fenders: 16 Gauge Rolled Steel with a non-skid upper surface
    e. Safety Chains: Two 3 ft. long (as measured from the end of the trailer tongue) galvanized steel ¼ Inch, with 2,500 lb Slip Safety Hooks
    f. Reflectors: One on each side, two amber at front, two at rear
6. Frame providing a safe, non-skid upper standing surface suitable for accessing the sign panel assembly.
    a. The trailer shall have a spare tire and wheel mounted to the unit for each trailer supplied. The tire shall be of the same size and load rating as the one supplied on the trailer.
    b. The trailer frame and tongue shall be outlined in its entirety with Red and White DOT retroreflective tape.
    c. Trailer frame shall have the ability to securely stow barrels and cones for traffic control to the exterior of the trailer.
7. Auxiliary Storage:
    a. Ability to securely carry 6 standard traffic barrels with bases.
    b. Mounted to the side or back of the trailer without extending into the roadway or the blocking the license plate.
    c. Vendor must submit detailed design drawing for approval.
8. Electrical requirements shall conform to NEMA TS4, as a minimum, plus the following requirements:
    a. Seven pin (flat R.V. type) trailer electrical connector with 3 ft. long cable, as measured from the end of the hitch.
    b. Connectors shall be locking electrical connector type.
    c. All wiring connections or splices on the trailer shall be soldered with a sealant encapsulated heat shrink tube installed over the splice or connection.
    d. All lighting supplied for the trailer such as the Stop/Tail/Turn signals and marker lights Shall be LED.
    e. All wiring shall be contained within tubular framing (preferred) or contained within conduit secured to the trailer frame. Wiring should not be directly lashed to the frame.
    f. The trailer axle shall have electric brakes at each wheel. The battery for the emergency break away shall be wired as to allow the vehicle to charge the battery when towing and also have a solar powered trickle charger to keep the battery fully charged when not in use.

The Transportable Trailer shall consist of complete units, including installed sensors, signs, and power supplies delivered on-site in accordance with delivery instructions from The Department and to the satisfaction of the TMC Manager, complete and accepted.

17.8 Power Supply

The PDMS shall be capable of operating from a solar powered electrical system, existing commercial electrical service, or via connection to a generator.

The power source shall allow the system to accept existing 120V commercial electrical service.
A regulated AC power supply shall provide reliable DC power.

Short circuit and over-current protection shall be integral to the power supply.
The power source shall be enclosed in a protective housing.

Power supplies shall operate within a temperature range of -22° to +120°F. The lower temperature range when compared with the overall ambient temperature range is explained by the fact that the power supplies are placed inside of the environmentally controlled sign housing and/or sign controller housing.

Power supply shall be UL listed if the power supply is manufactured by specific power supply manufacturer.
Sign controller shall be able to sense the failure of each individual power supply. When one of the power supplies in a group has failed, the status change of each power supply shall be reported to the central system and be visible on the DMS controller's local display (upon request).

The PDMS Shall be equipped with an on-board charging System able to re-charge the battery banks using a solar array or AC power connection.

Solar System and Battery Bank – Equip the PDMS with a solar array and battery power system capable of being recharged in both full sun and cloudy conditions. The battery power and solar array system shall:

1. Provide sufficient power to drive the display matrix, lighting and all other portable DMS components.
2. Display a two-page message for 21 consecutive days without auxiliary charge assuming sufficient sun/cloud coverage to keep the battery charge.
3. Be rated at 1800-amp hours at 70°F
4. Provide a minimum of 12 volts of operating voltage to the sign
5. Consist of a minimum of 1 and a maximum of 16 marine-type deep cycle discharge (80%) batteries and be able to withstand a minimum of 500 deep cycle discharges. The minimum number of batteries shall be capable of fulfilling all other requirements stated herein.
6. Be charged from solar cells through a photovoltaic regulator with thermal compensation and have a low voltage shut-off to prevent battery depletion with an auto reset feature to allow solar charging system to resume when sufficient solar power is generated.
7. Have the ability to be charged from a 110 or 120 volt, regulated AC outlet and shall be charged to 95100% of the total output voltage within 48 hours.
8. The charging device shall automatically shut off when the battery system is fully charged to prevent over-charging.
9. Recharge in full sunlight at a rate of 6 hours of recharging per 24 hours of sign operation.
10. Be located at the highest point of the sign housing.
11. Be secured by locking bolts to prevent pilferage and vandalism.
12. Be able to rotate ("panning") independently of the sign panel assembly and be able to tilt from 0 degrees to 40 degrees (relative to the horizontal).
13. The array shall be able to be locked into any position.
14. Be secured by a locking mechanism that prevents rotation during transport of the sign from one location to another.

Provide documentation sufficient in guiding the technician setting up the PDMS to orient the solar panels such that the maximum solar power can be obtained during a typical day.
Plug-in AC Power – Provide an AC-to-DC power converter and a power receptacle to allow the use of power feed from an alternate power source such as a generator set on or adjacent to the trailer or a road-side power service. Provide a plug-in AC power system meeting the following:

1. All wiring from power sources to portable DMS equipment shall use locking cable connectors.
2. Volt and amp gauges shall be provided for DC.
3. Standard negative ground system shall be tied to the sign chassis.

4. Lightning protection shall be supplied to the load side of the sign system's distributed power lines to withstand multiple surges in excess of 600 volts.
5. The power supply shall provide 12V automobile electrical service via a standard cigarette lighter socket for operating a laptop computer.

18.0 Portable Dynamic Message Sign – Type 2 – Freeway, Full Matrix, Color

18.1 General

Design and Furnish a Light Emitting Diode (LED) Portable Dynamic Message Sign (PDMS) providing a full matrix color display for traveler information and freeway work zone applications. The PDMS matrix shall be sized sufficient to provide display of three (3) lines of eight (8) characters, with a nominal character size of 18 inches in a standard 5x7 font, with a minimum of four (4) LEDs per pixel.

18.2 Sign Panel Enclosure

Provide a PDMS for mounting to the PDMS trailer frame. The enclosure shall be of such design and shape as to house all necessary LED display module, display driver, power and control equipment.
Provide an enclosure that is weatherproof to protect the interior components from water, dust, dirt, corrosion and any other foreign objects.

The enclosure is to be constructed of corrosion resistant aluminum material conforming to the following:

7. Sheet aluminum shall be fabricated from aluminum alloy sheet meeting the requirements of ASTM B 209, Alloy 5052, Temper H3, or equivalent, minimum .125 inch thick.
8. Cast aluminum shall be fabricated from aluminum alloy meeting the requirements of ASTM B 686, Alloy A 356 (A 13560) or equivalent. Flat cast surfaces exceeding 12 inches in both directions shall have a minimum thickness of 0.25 inches. Flat cast surfaces not exceeding 12 inches in both directions shall have a minimum thickness of 0.187 inches.
9. All PDMS enclosures shall meet the requirements for TYPE 3R enclosures according to NEMA Standard Publication 250. All seams and openings shall be designed to prevent entry of water resulting from high pressure washing of the LED PDMS enclosure.
10. Unpainted aluminum PDMS enclosures shall be fabricated from mill-finish material and shall be cleaned using appropriate methods that will remove oil, film, weld black, and mill ink marks and render the surface clean, bright, smooth and non-sticky to touch.
11. Corrosion protection shall be provided between dissimilar metals by isolating them.
12. Vendors that do not manufacture an aluminum enclosure may propose a powder coated steel enclosure, meeting the requirements of NEMA TS 4-2005 and for TYPE 3R enclosures according to NEMA Standard Publication 250 that meets or exceeds the corrosion resistance requirements of the aluminum enclosures specified herein.

All welds shall be continuously welded. All corners and seams shall be professionally welded to provide a weatherproof seal around the entire case and to ensure that the housing is structurally sound. Welds using heli-arc, gas metal arc, gas tungsten arc and plasma arc welding processes, all allowable for aluminum welding, are acceptable.

All visible surfaces shall have a maintenance free protective treatment and/or paint coating with a design life of 10 years, minimum. The sign panel housing shall be painted or powder-coated Highway Safety Orange in conformance with Federal Standard 595b, Color No. 12443 on the sides and back. The front sign face shall be flat back in accordance with Federal Standard 595b, Color No. 37030.

All nuts and bolts used in the PDMS assembly shall be stainless steel. All connecting surfaces shall be weatherproof and watertight when secured. All internal components shall be mounted so that there are no external protrusions. Forged rings shall be provided for moving and positioning of the extendable sign housing.

Appropriate precautions, such as heating elements or ventilation fans or openings, shall be taken to ensure that condensation does not occur between the matrix elements and the PDMS face, and that the environment inside all enclosures remains within the temperature and humidity limits required for proper operation of the sign's electronic components.

The dead load shall consist of the total weight as installed of the PDMS enclosure and appurtenances. The point of application of weights of the individual items shall be their representative centers of gravity.

Ice load shall be as per AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries, and Traffic Signals except that ice load shall be applied to all sides and top surfaces of the PDMS enclosure simultaneously.

Wind load shall be as per AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals except as modified herein. The enclosure and their mountings shall withstand a sustained wind speed of 90 miles per hour (mph), with a gust factor of 1.3 when using the four 27" outriggers (see Trailer Specifications).

Drain holes shall be provided and designed to remove any condensation that may form inside the PDMS enclosure and allow any water that may have collected in the housing to escape. All holes shall be screened to prevent small objects, insects, and creatures from entering into the enclosure.

Border around the sign housing (referred to as 'legend' in NTCIP terms) on all four edges shall be within a range of 6 to 12 inches.

Locks for all PDMS enclosures shall be of a type to be approved by The Department.
The enclosure shall have one or more lockable sign access cover latches and interior housing lighting that turns on when the sign access cover(s) is/are opened and that turns off when the sign access cover(s) is/are closed.
The controller cabinet shall provide a keyboard storage location. The keyboard shall be secured so that it is held securely in place during transport.

The controller cabinet shall be watertight to avoid that the sign controller, the keyboard, or any other sensitive equipment is exposed to any water or other particles that might negatively affect their operation.

Removal of any of the display modules or any other electronic or electrical component, shall not alter the structural integrity of the PDMS display assembly or the PDMS enclosure.

The Vendor shall submit fabrication and shop drawings and design calculations for all PDMS enclosures, ventilation, and mounting, sealed by a Professional Engineer licensed in the state(s) where the sign(s) is to be installed.

18.3 Display Face

Provide a sign face that complies with Federal Specification TT-E-489. Equip the sign display with a shatter-resistant cover that is optically clear, high impact, scratch resistant, low glare, and ultraviolet stabilized polycarbonate plastic (i.e., Lexan with stabilizer or approved equal) of not less than 3/16 of an inch in thickness and is manufactured from virgin materials by a major manufacturer. Covers containing recycled materials are unacceptable.

The pigmentation of the polycarbonate and its optical characteristics shall be matched to the wavelength of the LED's to guarantee the transmission of at least 80% of the light emitted, as certified by the polycarbonate manufacturer. The PDMS face cover shall be ultraviolet (UV) inhibiting, providing a minimum reduction of 80% of both UV type A and UV type B light that reaches the LED's, as certified by the polycarbonate manufacturer.

The cover is to be of sufficient thickness and strength to withstand cleaning, installation, removal, sign vibration, and negative/positive pressure loading due to atmospheric wind as well as pressures created by the passage of large trucks.

Where possible, the display face cover shall be one continuous sheet. Multiple sections with seams shall only be acceptable where the size of the sign will not allow for the installation of one continuous sheet, and only with the approval of the Department. The number of seams shall be kept to a minimum. Seams shall be water-tight, transparent and shall not obscure the viewing of the displayed message by oncoming traffic.

The display face cover shall be field replaceable with common hand tools and lifting equipment, if required, in less than four (4) hours. Removal of any combination of sign face windows shall not alter the structural integrity of the sign display cover nor the sign.

The display face cover shall be anti-glare and positioned to minimize glare effects. It shall have a light transmission degradation that is less than 10% from the original for ten years. This shall be measured by determining the light transgression when the sign is provided and measuring it yearly. If the light transgression is greater than 10% within the time frame specified above, the PDMS sign face cover shall be replaced at no cost to the Department.

Attachment of all sign face windows shall utilize a reusable gasket for weatherproofing. The usable life of all gaskets shall be at least ten (10) years. Gasketing shall be closed cell neoprene, permanently bonded to the metal. The mating surfaces of the gasketing shall be covered with a silicon lubricant to prevent sticking. The lubricant used shall not degrade the neoprene over time. The attachment mechanism for all sign face covers allows the cover material to expand and contract (due to temperature fluctuations) yet retain a weatherproof seal.

18.4 Sign Mounting

The structural support framework shall allow the system to be assembled into a unit and be mounted on the trailer, and shall provide the support mechanism between the sign panel assembly, the power supply, and the controller. The framework shall provide sufficient support to prevent damage to any PDMS components when the sign is in the down and locked position during normal highway travel up to 70 mph.

Provide an accessible mechanism to easily raise and lower the display assembly. Provide a locking device to lock the display panel in the raised or lowered position. Provide a single metal telescoping mast pole to mount the PDMS that is integral to the body of the trailer. Provide a support capable of adjusting the height of the sign and allowing the sign to rotate 360 degrees around the vertical axis of the mast pole, without requiring more than a single operator to perform height or angle adjustments. Equip locking mechanisms that allow the PDMS to be locked in position at any angle of rotation. Provide the ability to elevate the center point of the sign face to a minimum height of 10 feet above ground level. The sign mast and locking mechanisms shall allow complete sign operation including raising, lowering, and rotating the sign during maximum sustained wind speeds of 90 mph with a gust factor of 1.3.

18.5 Sign Display

The LEDs that make up the display modules shall be high luminous intensity T-1 3/4" type manufactured by a reputable manufacturer. The LEDs shall have an ultraviolet light inhibitor in the epoxy dome package and be of a production type already tested for use in high vibration commercial traffic environments and climate of the mid-Atlantic United States.

Each PDMS LED module shall be comprised of Red Green and Blue LEDs that meet the following specifications:

1. Red LEDs shall utilize AlInGaP semiconductor technology and shall emit red light that has a peak wavelength of 615-635nm.
2. Green LEDs shall utilize InGaN semiconductor technology and shall emit green light that has a peak wavelength of 520-535nm.
3. Blue LEDs shall utilize InGaN semiconductor technology and shall emit blue light that has a peak wavelength of 464-475nm.

All LEDs shall have a nominal viewing cone of 30 degrees with a half-power angle of 15 degrees measured from the longitudinal axis of the LED.

The LEDs shall be rated by the LED manufacturer to have a minimum lifetime of 100,000 hours of continuous operation while maintaining a minimum of 70% of the original brightness.

The LEDs used in the display shall be obtained from batches sorted for luminous output, where the highest luminosity LED in the batch shall not be more than fifty percent more luminous than the lowest luminosity LED in the batch when operated at the manufacturer's recommended drive current. To ensure uniformity of display and operational life, all LEDs used to make up a display module shall be obtained from the same manufacturing batch. The LED manufacturer shall perform intensity sorting of the bins. LEDs shall be obtained from no more than two (2) consecutive luminous intensity "bins" as defined by the LED manufacturer.

The LED manufacturer shall perform color sorting of the bins. LEDs shall be obtained from no more than two (2) consecutive color "bins" as defined by the LED manufacturer.

The LED mean time before failure (MTBF) shall be a minimum of 100,000 hours of elapsed time calendar hours use in an ambient temperature of 131 degrees Fahrenheit, based on an average daily on-time usage factor of 50%, when driven at the specific forward current recommended by the LED manufacturer for normal daylight PDMS display operation. As part of the LED manufacturer's technical specification sheet submittal, the specific forward current shall be noted.

The statistical average long term light output degradation of the LEDs used in the display, operated at the LED manufacturer's recommended drive current to achieve a minimum of 100,000 hours of operation without catastrophic failure in an ambient temperature of 131 degrees Fahrenheit, shall not exceed the following:

1. A maximum of 10% reduction in light output after 10,000 hours of continuous on time.
2. A maximum of 25% reduction in light output after 50,000 hours of continuous on time.
3. A maximum of 30% reduction in light output after 100,000 hours of continuous on-time.
4. Manufacturer's documentation for high temperature operating life (HTOL) shall indicate if HTOL values are based upon actual or extrapolated data.

The LED display modules shall have a minimum refresh rate of 60 times per second to prevent visible flicker.

The LEDs shall be grouped in pixels consisting of discrete LEDs arranged in a continuous matrix display with individual pixel addressability. The centers of all pixels shall be arranged so as to maintain the same horizontal and vertical spacing between adjacent pixels. All pixels shall be replaceable. The LED grouping and mounting angle shall be optimized for maximum readability.

The electronics for the PDMS shall be fully configured to drive the total required number of LEDs. The failure of any one pixel shall not affect the operation of any other pixel. The power driver circuitry shall be designed to minimize power consumption. Each LED display module shall have a diagnostic capability to detect a failure on the LED display module, down to the pixel level and report the failure to the PDMS controller.

Removal of any display module shall not affect the operation of the remaining modules.

The LED modules shall be protected from degradation due to sunlight. The method used shall not obstruct the view of the display or reduce the viewing angle below that provided by an unprotected LED module. The method and design of the PDMS sunlight protection shall be approved by the Department.

All PDMS must be capable of meeting or exceeding the Manual of Uniform Traffic Control Devices (MUTCD) guidelines for inter-character and inter-line spacing of 25% and 50% of character height, respectively.

The 18" character shall be clearly visible and legible from in-vehicle distance of 720 feet from the PDMS face under clear daylight and nighttime conditions with the PDMS face positioned in the roadway line of sight.

The PDMS shall have a photocell controlled dimming circuit which shall automatically adjust the luminance of the LED display pixels in accordance with ambient light conditions. As part of the Proposer's submittal, a complete schematic of the LED display power, driver and dimming circuits shall be provided for approval by the Department.

18.6 Sign Controller

Equip each PDMS with a sign controller that contains all the necessary hardware and software to control the sign. The controller is to be a compact unit with no dimension greater than 19" as mounted on the trailer and be located for easy access.

The PDMS controller shall:

1. Be solid-state and removable
2. Be able to generate and store messages.
    a. Provide ability to generate two-phase messages including text and MUTCD compliant graphics.
    b. Provide ability to store up to fifty (50) messages locally.
3. Include an LCD display screen upon which messages can be reviewed before display on the message sign
4. Have a keyboard that shall:
    a. Allow operator to access, generate, and store messages in the controller.
    b. Have tactile feedback (a membrane-type keyboard is not acceptable).
    c. In lieu of a keyboard, a hand-held terminal may be used.
5. Be able to conduct automatic system recovery after communications outages to the central controller without operator intervention.
6. Be able to be controlled from one or more remote units. The controller shall be able to:
    a. Accept a message for display.
    b. Restart or sequence a display mode operation with currently stored RAM messages.
7. Have an RS-232 port to facilitate connection of an external communication device.
8. Be able to monitor and display the status of the photocell and adjust the sign illumination to match the ambient light conditions.
    a. With each DMS display and controller, the Contractor shall furnish and install a system which shall detect the background ambient light level and provide a minimum of eight adjustable ambient light input levels.
    b. The controller shall have adjustable levels of light output from 10% to 100% brightness in 5% increments.
    c. Dimming shall be implemented with a mechanism such as high frequency variation of the display duty cycle (pulse width modulation) in order to minimize any detrimental flickering.
    d. The dimming system shall conform to the requirements stated in NEMA TS4-2005, Section 8.8 plus the following additional requirements (which are stricter than those stated in TS4):
        i. Photo-Electric Sensors - The dimming system shall contain a minimum of three commercially available photo-electric sensors.
        ii. The photo-electric sensors shall be placed so that they detect the ambient light levels striking the top, front, and rear of each sign.
        iii. Dimming Levels - Manual and automatic dimming modes shall be provided enabling the user to select the desired mode of operation.
        iv. The dimming system shall select a minimum of one of eight levels from the detected ambient light. The set points for each of the eight ambient light levels shall be set within user adjustable software.
        v. Manual dimming shall be accomplished locally and remotely.
            1. Local control shall be with a laptop computer connected to the port furnished in the field controller.
            2. Remote control shall be achieved by calling the field controller with the central or remote computers.
        vi. The photo- electric system shall be capable of distinguishing between fog and nighttime light inputs.

1. The dimming system shall be pre-programmed so that, if fog is present, over bright light output is turned on.
2. If nighttime light input is detected, the dimming system shall be pre-programmed to output reduced light output.

vii. If either the upstream facing sensor or the downstream facing sensor's reading is greater than the day limit, the over bright level of pixel luminance shall be used; otherwise the daytime level shall be used.
viii. In case of luminance control system failure, the luminance level shall be designed to default to the night level.
ix. The controller shall automatically report any luminance/brightness failures to the control computer.

e. All light sensors shall be located in an easily accessible location for maintenance.
   i. All light sensors shall be mounted in a way that permits adjustment of the aiming angle.
   ii. For sign structures containing more than one LED DMS unit, one set of three light sensors shall be used per structure

9. Provide a calendar program within the controller that enables to automatically start and stop the display of messages at predetermined times.
   a. These scheduled messages shall work even when communication to the TMC is lost.
   b. The scheduled messaged shall be able to be programmed both locally and remotely.
10. Provide a reporting mechanism that stores all events such as the actual times and dates when a message was displayed, where is originated (scheduler, manual local, manual central), any failures including communications failures, power failures, and any recoveries from failures.
11. Provide for the controller to be queried to check the display for pixel failures and to report the failures.
12. Report the ambient temperature and the sign housing temperature.
13. Monitor and display the battery output voltage and solar array activities (charging/discharging).
    a. The controller shall blank the sign when the output voltage drops below the manufacturer's recommended output level. In this case, the controller software automatically switches the trailer to a minimum power mode to preserve batteries.
    b. The PDMS shall use the DMS Power Loss Message data element to achieve this functionality. Note: while this is a slight bending of the actual definition of the DMS Power Loss Message data element, the intent of this parameter is still fulfilled (the power is theoretically insufficient to display the message)

18.7 Trailer

The trailer shall conform to Delaware Law governing trailers. The trailer shall be primed and painted or powder-coated Highway Safety Orange in conformance with Federal Standard 595b, Color N. 12243.

All equipment covers and storage boxes shall have a locking mechanism for security. All locks (Pad Locks and Locking Handles) for any and all units purchased under this contract shall be keyed the same for the life of the contract. The Transportable Trailer shall meet the following requirements:

1. Maximum Dimensions:
   a. Length: 122 inches nominal. The length of the trailer shall conform to Delaware Law governing trailers and shall be transportable utilizing a vehicle with a load rating no greater than 3/4 ton.
   b. Width: maximum of 96 inches overall
   c. Travel height shall not exceed 112 inches
   d. Operating height shall not exceed 204 inches
2. Materials utilized shall conform to NEMA TS4-2016
3. Sign Panel Mast:
   a. The lift mechanism shall be an electric or electrically-assisted hydraulic mechanism able to raise and lower the sign panel.
   b. The mechanism shall have a manual pump jack mechanism able to raise and lower the sign panel in case of failure of the hydraulic jack.

c. A safety bolt, hot dipped galvanized in accordance with ASTM A153 or made of stainless steel, shall be provided to prevent the sign panel from lowering once in the raised position. A self-locking mechanism shall be incorporated into the safety bolt that prevents it from being inadvertently dislodged.
d. The lift mechanism shall allow the raised sign panel to rotate 360 degrees about the vertical axis.
    i. Rotation shall be possible in either a clockwise or counter-clockwise direction.
    ii. A locking mechanism shall be provided to prevent rotation of the sign panel assembly once the sign panel is in place, at any position.
e. Provide ability to mount a pan-tilt-zoom CCTV camera to the top of the Sign Panel Mast including mounting hardware. CCTV camera devices to be provided by the Department.

4. Battery Box utilized shall conform to NEMA TS4 plus the following requirements:
    a. #14 Gauge Steel, Hinged Telescoping Door Support
    b. Battery Lock Down Assembly
5. Mechanical requirements shall conform to NEMA TS4 plus the following requirements:
    a. Provide extendable Stabilizers: Four 27" adjustable outriggers
    b. Hitch: Tow Ready Adjustable Lunette Ring with Channel
        i. Compatible with all pintle hooks
        ii. Two inch ball
        iii. Heavy Duty Design
        iv. Forged Alloy Steel with a black powder coat finish
        v. Inner diameter: 3 inches
        vi. Outside diameter: 6 inches
        vii. Capacity: 12,000 GTW
    c. Roller Bearings: Yes
    d. Fenders: 16 Gauge Rolled Steel with a non-skid upper surface
    e. Safety Chains: Two 3 ft. long (as measured from the end of the trailer tongue) galvanized steel ¼ Inch, with 2,500 lb Slip Safety Hooks
    f. Reflectors: One on each side, two amber at front, two at rear
6. Frame providing a safe, non-skid upper standing surface suitable for accessing the sign panel assembly.
    a. The trailer shall have a spare tire and wheel mounted to the unit for each trailer supplied. The tire shall be of the same size and load rating as the one supplied on the trailer.
    b. The trailer frame and tongue shall be outlined in its entirety with Red and White DOT retroreflective tape.
    c. Trailer frame shall have the ability to securely stow barrels and cones for traffic control to the exterior of the trailer.
7. Auxiliary Storage:
    a. Ability to securely carry 6 standard traffic barrels with bases.
    b. Mounted to the side or back of the trailer without extending into the roadway or the blocking the license plate.
    c. Vendor must submit detailed design drawing for approval.
8. Electrical requirements shall conform to NEMA TS4, as a minimum, plus the following requirements:
    a. Seven pin (flat R.V. type) trailer electrical connector with 3 ft. long cable, as measured from the end of the hitch.
    b. Connectors shall be locking electrical connector type.
    c. All wiring connections or splices on the trailer shall be soldered with a sealant encapsulated heat shrink tube installed over the splice or connection.
    d. All lighting supplied for the trailer such as the Stop/Tail/Turn signals and marker lights Shall be LED.
    e. All wiring shall be contained within tubular framing (preferred) or contained within conduit secured to the trailer frame. Wiring should not be directly lashed to the frame.
    f. The trailer axle shall have electric brakes at each wheel. The battery for the emergency break away shall be wired as to allow the vehicle to charge the battery when towing and also have a solar powered trickle charger to keep the battery fully charged when not in use.

The Transportable Trailer shall consist of complete units, including installed sensors, signs, and power supplies delivered on-site in accordance with delivery instructions from The Department and to the satisfaction of the TMC Manager, complete and accepted.

18.8 Power Supply

The PDMS shall be capable of operating from a solar powered electrical system, existing commercial electrical service, or via connection to a generator.
The power source shall allow the system to accept existing 120V commercial electrical service.
A regulated AC power supply shall provide reliable DC power.
Short circuit and over-current protection shall be integral to the power supply.
The power source shall be enclosed in a protective housing.

Power supplies shall operate within a temperature range of -22° to +120°F. The lower temperature range when compared with the overall ambient temperature range is explained by the fact that the power supplies are placed inside of the environmentally controlled sign housing and/or sign controller housing.

Power supply shall be UL listed if the power supply is manufactured by specific power supply manufacturer
Sign controller shall be able to sense the failure of each individual power supply. When one of the power supplies in a group has failed, the status change of each power supply shall be reported to the central system and be visible on the DMS controller's local display (upon request).

The PDMS Shall be equipped with an on-board charging System able to re-charge the battery banks using a solar array or AC power connection.

Solar System and Battery Bank – Equip the PDMS with a solar array and battery power system capable of being recharged in both full sun and cloudy conditions. The battery power and solar array system shall:

1. Provide sufficient power to drive the display matrix, lighting and all other portable DMS components.
2. Display a two-page message for 21 consecutive days without auxiliary charge assuming sufficient sun/cloud coverage to keep the battery charge.
3. Be rated at 1800 amp hours at 70°F
4. Provide a minimum of 12 volts of operating voltage to the sign
5. Consist of a minimum of 1 and a maximum of 16 marine-type deep cycle discharge (80%) batteries and be able to withstand a minimum of 500 deep cycle discharges. The minimum number of batteries shall be capable of fulfilling all other requirements stated herein.
6. Be charged from solar cells through a photovoltaic regulator with thermal compensation and have a low voltage shut-off to prevent battery depletion with an auto reset feature to allow solar charging system to resume when sufficient solar power is generated.
7. Have the ability to be charged from a 110 or 120 volt, regulated AC outlet and shall be charged to 95 100% of the total output voltage within 48 hours.
8. The charging device shall automatically shut off when the battery system is fully charged to prevent over-charging.
9. Recharge in full sunlight at a rate of 6 hours of recharging per 24 hours of sign operation.
10. Be located at the highest point of the sign housing.
11. Be secured by locking bolts to prevent pilferage and vandalism.
12. Be able to rotate ("panning") independently of the sign panel assembly and be able to tilt from 0 degrees to 40 degrees (relative to the horizontal).
13. The array shall be able to be locked into any position.
14. Be secured by a locking mechanism that prevents rotation during transport of the sign from one location to another.

Provide documentation sufficient in guiding the technician setting up the PDMS to orient the solar panels such that the maximum solar power can be obtained during a typical day.

Plug-in AC Power – Provide an AC-to-DC power converter and a power receptacle to allow the use of power feed from an alternate power source such as a generator set on or adjacent to the trailer or a road-side power service. Provide a plug-in AC power system meeting the following:

1. All wiring from power sources to portable DMS equipment shall use locking cable connectors.
2. Volt and amp gauges shall be provided for DC.
3. Standard negative ground system shall be tied to the sign chassis.
4. Lightning protection shall be supplied to the load side of the sign system's distributed power lines to withstand multiple surges in excess of 600 volts.
5. The power supply shall provide 12V automobile electrical service via a standard cigarette lighter socket for operating a laptop computer.

19.0 Portable Dynamic Message Sign – Type 3 – Arterial, Full Matrix, Amber

19.1 General

Design and Furnish a Light Emitting Diode (LED) Portable Dynamic Message Sign (PDMS) providing a full matrix amber display for traveler information and freeway work zone applications. The PDMS matrix shall be sized sufficient to provide display of three (3) lines of eight (8) characters, with a nominal character size of 12 inches in a standard 5x7 font, with a minimum of four (4) LEDs per pixel.

19.2 Sign Panel Enclosure

Provide a PDMS for mounting to the PDMS trailer frame. The enclosure shall be of such design and shape as to house all necessary LED display module, display driver, power and control equipment.
Provide an enclosure that is weatherproof to protect the interior components from water, dust, dirt, corrosion and any other foreign objects.

The enclosure is to be constructed of corrosion resistant aluminum material conforming to the following:

1. Sheet aluminum shall be fabricated from aluminum alloy sheet meeting the requirements of ASTM B 209, Alloy 5052, Temper H3, or equivalent, minimum .125 inch thick.
2. Cast aluminum shall be fabricated from aluminum alloy meeting the requirements of ASTM B 686, Alloy A 356 (A 13560) or equivalent. Flat cast surfaces exceeding 12 inches in both directions shall have a minimum thickness of 0.25 inches. Flat cast surfaces not exceeding 12 inches in both directions shall have a minimum thickness of 0.187 inches.
3. All PDMS enclosures shall meet the requirements for TYPE 3R enclosures according to NEMA Standard Publication 250. All seams and openings shall be designed to prevent entry of water resulting from high pressure washing of the LED PDMS enclosure.
4. Unpainted aluminum PDMS enclosures shall be fabricated from mill-finish material and shall be cleaned using appropriate methods that will remove oil, film, weld black, and mill ink marks and render the surface clean, bright, smooth and non-sticky to touch.
5. Corrosion protection shall be provided between dissimilar metals by isolating them.
6. Vendors that do not manufacture an aluminum enclosure may propose a powder coated steel enclosure, meeting the requirements of NEMA TS 4-2005 and for TYPE 3R enclosures according to NEMA Standard Publication 250 that meets or exceeds the corrosion resistance requirements of the aluminum enclosures specified herein.

All welds shall be continuously welded. All corners and seams shall be professionally welded to provide a weatherproof seal around the entire case and to ensure that the housing is structurally sound. Welds using heli-arc, gas metal arc, gas tungsten arc and plasma arc welding processes, all allowable for aluminum welding, are acceptable.

All visible surfaces shall have a maintenance free protective treatment and/or paint coating with a design life of 10 years, minimum. The sign panel housing shall be painted or powder-coated Highway Safety Orange in conformance with Federal Standard 595b, Color No. 12443 on the sides and back. The front sign face shall be flat back in accordance with Federal Standard 595b, Color No. 37030.

All nuts and bolts used in the PDMS assembly shall be stainless steel. All connecting surfaces shall be weatherproof and watertight when secured. All internal components shall be mounted so that there are no external protrusions. Forged rings shall be provided for moving and positioning of the extendable sign housing.

Appropriate precautions, such as heating elements or ventilation fans or openings, shall be taken to ensure that condensation does not occur between the matrix elements and the PDMS face, and that the environment inside all enclosures remains within the temperature and humidity limits required for proper operation of the sign's electronic components.

The dead load shall consist of the total weight as installed of the PDMS enclosure and appurtenances. The point of application of weights of the individual items shall be their representative centers of gravity.

Ice load shall be as per AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries, and Traffic Signals except that ice load shall be applied to all sides and top surfaces of the PDMS enclosure simultaneously.

Wind load shall be as per AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals except as modified herein. The enclosure and their mountings shall withstand a sustained wind speed of 90 miles per hour (mph), with a gust factor of 1.3 when using the four 27" outriggers (see Trailer Specifications).
Drain holes shall be provided and designed to remove any condensation that may form inside the PDMS enclosure and allow any water that may have collected in the housing to escape. All holes shall be screened to prevent small objects, insects, and creatures from entering the enclosure.

Border around the sign housing (referred to as 'legend' in NTCIP terms) on all four edges shall be within a range of 6 to 12 inches.

Locks for all PDMS enclosures shall be of a type to be approved by The Department.

The enclosure shall have one or more lockable sign access cover latches and interior housing lighting that turns on when the sign access cover(s) is/are opened and that turns off when the sign access cover(s) is/are closed.
The controller cabinet shall provide a keyboard storage location. The keyboard shall be secured so that it is held securely in place during transport.

The controller cabinet shall be watertight to avoid that the sign controller, the keyboard, or any other sensitive equipment is exposed to any water or other particles that might negatively affect their operation.
Removal of any of the display modules or any other electronic or electrical component, shall not alter the structural integrity of the PDMS display assembly or the PDMS enclosure.

The Vendor shall submit fabrication and shop drawings and design calculations for all PDMS enclosures, ventilation, and mounting, sealed by a Professional Engineer licensed in the state(s) where the sign(s) is to be installed.

19.3 Display Face

Provide a sign face that complies with Federal Specification TT-E-489. Equip the sign display with a shatter-resistant cover that is optically clear, high impact, scratch resistant, low glare, and ultraviolet stabilized polycarbonate plastic (i.e., Lexan with stabilizer or approved equal) of not less than 3/16 of an inch in thickness and is manufactured from virgin materials by a major manufacturer. Covers containing recycled materials are unacceptable.

The pigmentation of the polycarbonate and its optical characteristics shall be matched to the wavelength of the LED's to guarantee the transmission of at least 80% of the light emitted, as certified by the polycarbonate

manufacturer. The PDMS face cover shall be ultraviolet (UV) inhibiting, providing a minimum reduction of 80% of both UV type A and UV type B light that reaches the LED's, as certified by the polycarbonate manufacturer. The cover is to be of sufficient thickness and strength to withstand cleaning, installation, removal, sign vibration, and negative/positive pressure loading due to atmospheric wind as well as pressures created by the passage of large trucks.

Where possible, the display face cover shall be one continuous sheet. Multiple sections with seams shall only be acceptable where the size of the sign will not allow for the installation of one continuous sheet, and only with the approval of the Department. The number of seams shall be kept to a minimum. Seams shall be water-tight, transparent and shall not obscure the viewing of the displayed message by oncoming traffic.

The display face cover shall be field replaceable with common hand tools and lifting equipment, if required, in less than four (4) hours. Removal of any combination of sign face windows shall not alter the structural integrity of the sign display cover nor the sign.

The display face cover shall be anti-glare and positioned to minimize glare effects. It shall have a light transmission degradation that is less than 10% from the original for ten years. This shall be measured by determining the light transgression when the sign is provided and measuring it yearly. If the light transgression is greater than 10% within the time frame specified above, the PDMS sign face cover shall be replaced at no cost to the Department.

Attachment of all sign face windows shall utilize a reusable gasket for weatherproofing. The usable life of all gaskets shall be at least ten (10) years. Gasketing shall be closed cell neoprene, permanently bonded to the metal. The mating surfaces of the gasketing shall be covered with a silicon lubricant to prevent sticking. The lubricant used shall not degrade the neoprene over time. The attachment mechanism for all sign face covers allows the cover material to expand and contract (due to temperature fluctuations) yet retain a weatherproof seal.

19.4 Sign Mounting

The structural support framework shall allow the system to be assembled into a unit and be mounted on the trailer, and shall provide the support mechanism between the sign panel assembly, the power supply, and the controller. The framework shall provide sufficient support to prevent damage to any PDMS components when the sign is in the down and locked position during normal highway travel up to 65 mph.

Provide an accessible mechanism to easily raise and lower the display assembly. Provide a locking device to lock the display panel in the raised or lowered position. Provide a single metal telescoping mast pole to mount the PDMS that is integral to the body of the trailer. Provide a support capable of adjusting the height of the sign and allowing the sign to rotate 360 degrees around the vertical axis of the mast pole, without requiring more than a single operator to perform height or angle adjustments. Equip locking mechanisms that allow the PDMS to be locked in position at any angle of rotation. Provide the ability to elevate the center point of the sign face to a minimum height of 10 feet above ground level. The sign mast and locking mechanisms shall allow complete sign operation including raising, lowering, and rotating the sign during maximum sustained wind speeds of 90 mph with a gust factor of 1.3.

19.5 Sign Display

The LEDs that make up the display modules shall be high luminous intensity T-1 3/4" type manufactured by a reputable manufacturer. The LEDs shall have an ultraviolet light inhibitor in the epoxy dome package and be of a production type already tested for use in high vibration commercial traffic environments and climate of the mid-Atlantic United States.

Each PDMS LED module shall be comprised of Amber LEDs that meet AlInGaP semiconductor technology that has a peak wavelength of 588-592nm.

All LEDs shall have a nominal viewing cone of 30 degrees with a half-power angle of 15 degrees measured from the longitudinal axis of the LED.

The LEDs shall be rated by the LED manufacturer to have a minimum lifetime of 100,000 hours of continuous operation while maintaining a minimum of 70% of the original brightness.

The LEDs used in the display shall be obtained from batches sorted for luminous output, where the highest luminosity LED in the batch shall not be more than fifty percent more luminous than the lowest luminosity LED in the batch when operated at the manufacturer's recommended drive current. To ensure uniformity of display and operational life, all LEDs used to make up a display module shall be obtained from the same manufacturing batch. The LED manufacturer shall perform intensity sorting of the bins. LEDs shall be obtained from no more than two (2) consecutive luminous intensity "bins" as defined by the LED manufacturer.

The LED manufacturer shall perform color sorting of the bins. LEDs shall be obtained from no more than two (2) consecutive color "bins" as defined by the LED manufacturer.

The LED mean time before failure (MTBF) shall be a minimum of 100,000 hours of elapsed time calendar hours use in an ambient temperature of 131 degrees Fahrenheit, based on an average daily on-time usage factor of 50%, when driven at the specific forward current recommended by the LED manufacturer for normal daylight PDMS display operation. As part of the LED manufacturer's technical specification sheet submittal, the specific forward current shall be noted.

The statistical average long term light output degradation of the LEDs used in the display, operated at the LED manufacturer's recommended drive current to achieve a minimum of 100,000 hours of operation without catastrophic failure in an ambient temperature of 131 degrees Fahrenheit, shall not exceed the following:

1. A maximum of 10% reduction in light output after 10,000 hours of continuous on time.
2. A maximum of 25% reduction in light output after 50,000 hours of continuous on time.
3. A maximum of 30% reduction in light output after 100,000 hours of continuous on-time.
4. Manufacturer's documentation for high temperature operating life (HTOL) shall indicate if HTOL values are based upon actual or extrapolated data.

The LED display modules shall have a minimum refresh rate of 60 times per second to prevent visible flicker.

The LEDs shall be grouped in pixels consisting of discrete LEDs arranged in a continuous matrix display with individual pixel addressability. The centers of all pixels shall be arranged so as to maintain the same horizontal and vertical spacing between adjacent pixels. All pixels shall be replaceable. The LED grouping and mounting angle shall be optimized for maximum readability.

The electronics for the PDMS shall be fully configured to drive the total required number of LEDs. The failure of any one pixel shall not affect the operation of any other pixel. The power driver circuitry shall be designed to minimize power consumption. Each LED display module shall have a diagnostic capability to detect a failure on the LED display module, down to the pixel level and report the failure to the PDMS controller.

Removal of any display module shall not affect the operation of the remaining modules.

The LED modules shall be protected from degradation due to sunlight. The method used shall not obstruct the view of the display or reduce the viewing angle below that provided by an unprotected LED module. The method and design of the PDMS sunlight protection shall be approved by the Department.

All PDMS must be capable of meeting or exceeding the Manual of Uniform Traffic Control Devices (MUTCD) guidelines for inter-character and inter-line spacing of 25% and 50% of character height, respectively.

The 12" character shall be clearly visible and legible from in-vehicle distance of 500 feet from the PDMS face under clear daylight and nighttime conditions with the PDMS face positioned in the roadway line of sight.

The PDMS shall have a photocell controlled dimming circuit which shall automatically adjust the luminance of the LED display pixels in accordance with ambient light conditions. As part of the Proposer's submittal, a complete schematic of the LED display power, driver and dimming circuits shall be provided for approval by the Department.

19.6 Sign Controller

Equip each PDMS with a sign controller that contains all the necessary hardware and software to control the sign. The controller is to be a compact unit with no dimension greater than 19" as mounted on the trailer and be located for easy access.

The PDMS controller shall:

1. Be solid-state and removable
2. Be able to generate and store messages.
    a. Provide ability to generate two-phase messages including text and MUTCD compliant graphics.
    b. Provide ability to store up to fifty (50) messages locally.
3. Include an LCD display screen upon which messages can be reviewed before display on the message sign
4. Have a keyboard that shall:
    a. Allow operator to access, generate, and store messages in the controller.
    b. Have tactile feedback (a membrane-type keyboard is not acceptable).
    c. In lieu of a keyboard, a hand-held terminal may be used.
5. Be able to conduct automatic system recovery after communications outages to the central controller without operator intervention.
6. Be able to be controlled from one or more remote units. The controller shall be able to:
    a. Accept a message for display.
    b. Restart or sequence a display mode operation with currently stored RAM messages.
7. Have an RS-232 port to facilitate connection of an external communication device.
8. Be able to monitor and display the status of the photocell and adjust the sign illumination to match the ambient light conditions.
    a. With each DMS display and controller, the Contractor shall furnish and install a system which shall detect the background ambient light level and provide a minimum of eight adjustable ambient light input levels.
    b. The controller shall have a adjustable levels of light output from 10% to 100% brightness in 5% increments.
    c. Dimming shall be implemented with a mechanism such as high frequency variation of the display duty cycle (pulse width modulation) in order to minimize any detrimental flickering.
    d. The dimming system shall conform to the requirements stated in NEMA TS4-2005, Section 8.8 plus the following additional requirements (which are stricter than those stated in TS4):
        i. Photo-Electric Sensors - The dimming system shall contain a minimum of three commercially available photo-electric sensors.
        ii. The photo-electric sensors shall be placed so that they detect the ambient light levels striking the top, front, and rear of each sign.
        iii. Dimming Levels - Manual and automatic dimming modes shall be provided enabling the user to select the desired mode of operation.
        iv. The dimming system shall select a minimum of one of eight levels from the detected ambient light. The set points for each of the eight ambient light levels shall be set within user adjustable software.
        v. Manual dimming shall be accomplished locally and remotely.
            1. Local control shall be with a laptop computer connected to the port furnished in the field controller.
            2. Remote control shall be achieved by calling the field controller with the central or remote computers.
        vi. The photo- electric system shall be capable of distinguishing between fog and nighttime light inputs.

1. The dimming system shall be pre-programmed so that, if fog is present, over bright light output is turned on.
2. If nighttime light input is detected, the dimming system shall be pre-programmed to output reduced light output.

vii. If either the upstream facing sensor or the downstream facing sensor's reading is greater than the day limit, the over bright level of pixel luminance shall be used; otherwise the daytime level shall be used.
viii. In case of luminance control system failure, the luminance level shall be designed to default to the night level.
ix. The controller shall automatically report any luminance/brightness failures to the control computer.

e. All light sensors shall be located in an easily accessible location for maintenance.
   i. All light sensors shall be mounted in a way that permits adjustment of the aiming angle.
   ii. For sign structures containing more than one LED DMS unit, one set of three light sensors shall be used per structure

9. Provide a calendar program within the controller that enables to automatically start and stop the display of messages at predetermined times.
   a. These scheduled messages shall work even when communication to the TMC is lost.
   b. The scheduled messaged shall be able to be programmed both locally and remotely.
10. Provide a reporting mechanism that stores all events such as the actual times and dates when a message was displayed, where is originated (scheduler, manual local, manual central), any failures including communications failures, power failures, and any recoveries from failures.
11. Provide for the controller to be queried to check the display for pixel failures and to report the failures.
12. Report the ambient temperature and the sign housing temperature.
13. Monitor and display the battery output voltage and solar array activities (charging/discharging).
    a. The controller shall blank the sign when the output voltage drops below the manufacturer's recommended output level. In this case, the controller software automatically switches the trailer to a minimum power mode to preserve batteries.
    b. The PDMS shall use the DMS Power Loss Message data element to achieve this functionality. Note: while this is a slight bending of the actual definition of the DMS Power Loss Message data element, the intent of this parameter is still fulfilled (the power is theoretically insufficient to display the message)

19.7 Trailer

The trailer shall conform to Delaware Law governing trailers. The trailer shall be primed and painted or powder-coated Highway Safety Orange in conformance with Federal Standard 595b, Color N. 12243.

All equipment covers and storage boxes shall have a locking mechanism for security. All locks (Pad Locks and Locking Handles) for any and all units purchased under this contract shall be keyed the same for the life of the contract. The Transportable Trailer shall meet the following requirements:

1. Maximum Dimensions:
   a. Length: 122 inches nominal. The length of the trailer shall conform to Delaware Law governing trailers and shall be transportable utilizing a vehicle with a load rating no greater than 3/4 ton.
   b. Width: maximum of 96 inches overall
   c. Travel height shall not exceed 112 inches
   d. Operating height shall not exceed 204 inches
2. Materials utilized shall conform to NEMA TS4-2016
3. Sign Panel Mast:
   a. The lift mechanism shall be an electric or electrically-assisted hydraulic mechanism able to raise and lower the sign panel.
   b. The mechanism shall have a manual pump jack mechanism able to raise and lower the sign panel in case of failure of the hydraulic jack.

c. A safety bolt, hot dipped galvanized in accordance with ASTM A153 or made of stainless steel, shall be provided to prevent the sign panel from lowering once in the raised position. A self-locking mechanism shall be incorporated into the safety bolt that prevents it from being inadvertently dislodged.
d. The lift mechanism shall allow the raised sign panel to rotate 360 degrees about the vertical axis.
    i. Rotation shall be possible in either a clockwise or counter-clockwise direction.
    ii. A locking mechanism shall be provided to prevent rotation of the sign panel assembly once the sign panel is in place, at any position.
e. Provide ability to mount a pan-tilt-zoom CCTV camera to the top of the Sign Panel Mast including mounting hardware. CCTV camera devices to be provided by the Department.

4. Battery Box utilized shall conform to NEMA TS4 plus the following requirements:
    a. #14 Gauge Steel, Hinged Telescoping Door Support
    b. Battery Lock Down Assembly

5. Mechanical requirements shall conform to NEMA TS4 plus the following requirements:
    a. Provide extendable Stabilizers: Four 27" adjustable outriggers
    b. Hitch: Tow Ready Adjustable Lunette Ring with Channel
        i. Compatible with all pintle hooks
        ii. Two inch ball
        iii. Heavy Duty Design
        iv. Forged Alloy Steel with a black powder coat finish
        v. Inner diameter: 3 inches
        vi. Outside diameter: 6 inches
        vii. Capacity: 12,000 GTW
    c. Roller Bearings: Yes
    d. Fenders: 16 Gauge Rolled Steel with a non-skid upper surface
    e. Safety Chains: Two 3 ft. long (as measured from the end of the trailer tongue) galvanized steel ¼ Inch, with 2,500 lb Slip Safety Hooks
    f. Reflectors: One on each side, two amber at front, two at rear

6. Frame providing a safe, non-skid upper standing surface suitable for accessing the sign panel assembly.
    a. The trailer shall have a spare tire and wheel mounted to the unit for each trailer supplied. The tire shall be of the same size and load rating as the one supplied on the trailer.
    b. The trailer frame and tongue shall be outlined in its entirety with Red and White DOT retroreflective tape.
    c. Trailer frame shall have the ability to securely stow barrels and cones for traffic control to the exterior of the trailer.

7. Auxiliary Storage:
    a. Ability to securely carry 6 standard traffic barrels with bases.
    b. Mounted to the side or back of the trailer without extending into the roadway or the blocking the license plate.
    c. Vendor must submit detailed design drawing for approval.

8. Electrical requirements shall conform to NEMA TS4, as a minimum, plus the following requirements:
    a. Seven pin (flat R.V. type) trailer electrical connector with 3 ft. long cable, as measured from the end of the hitch.
    b. Connectors shall be locking electrical connector type.
    c. All wiring connections or splices on the trailer shall be soldered with a sealant encapsulated heat shrink tube installed over the splice or connection.
    d. All lighting supplied for the trailer such as the Stop/Tail/Turn signals and marker lights Shall be LED.

e. All wiring shall be contained within tubular framing (preferred) or contained within conduit secured to the trailer frame. Wiring should not be directly lashed to the frame.
f. The trailer axle shall have electric brakes at each wheel. The battery for the emergency break away shall be wired as to allow the vehicle to charge the battery when towing and also have a solar powered trickle charger to keep the battery fully charged when not in use.

The Transportable Trailer shall consist of complete units, including installed sensors, signs, and power supplies delivered on-site in accordance with delivery instructions from The Department and to the satisfaction of the TMC Manager, complete and accepted.

19.8 Power Supply

The PDMS shall be capable of operating from a solar powered electrical system, existing commercial electrical service, or via connection to a generator.

The power source shall allow the system to accept existing 120V commercial electrical service.
A regulated AC power supply shall provide reliable DC power.

Short circuit and over-current protection shall be integral to the power supply.
The power source shall be enclosed in a protective housing.

Power supplies shall operate within a temperature range of -22° to +120°F. The lower temperature range when compared with the overall ambient temperature range is explained by the fact that the power supplies are placed inside of the environmentally controlled sign housing and/or sign controller housing.

Power supply shall be UL listed if the power supply is manufactured by specific power supply manufacturer
Sign controller shall be able to sense the failure of each individual power supply. When one of the power supplies in a group has failed, the status change of each power supply shall be reported to the central system and be visible on the DMS controller's local display (upon request).

The PDMS Shall be equipped with an on-board charging System able to re-charge the battery banks using a solar array or AC power connection.

Solar System and Battery Bank – Equip the PDMS with a solar array and battery power system capable of being recharged in both full sun and cloudy conditions. The battery power and solar array system shall:

1. Provide sufficient power to drive the display matrix, lighting and all other portable DMS components.
2. Display a two-page message for 21 consecutive days without auxiliary charge assuming sufficient sun/cloud coverage to keep the battery charge.
3. Be rated at 1800 amp hours at 70°F
4. Provide a minimum of 12 volts of operating voltage to the sign
5. Consist of a minimum of 1 and a maximum of 16 marine-type deep cycle discharge (80%) batteries and be able to withstand a minimum of 500 deep cycle discharges. The minimum number of batteries shall be capable of fulfilling all other requirements stated herein.
6. Be charged from solar cells through a photovoltaic regulator with thermal compensation and have a low voltage shut-off to prevent battery depletion with an auto reset feature to allow solar charging system to resume when sufficient solar power is generated.
7. Have the ability to be charged from a 110 or 120 volt, regulated AC outlet and shall be charged to 95 100% of the total output voltage within 48 hours.
8. The charging device shall automatically shut off when the battery system is fully charged to prevent over-charging.
9. Recharge in full sunlight at a rate of 6 hours of recharging per 24 hours of sign operation.
10. Be located at the highest point of the sign housing.
11. Be secured by locking bolts to prevent pilferage and vandalism.

12. Be able to rotate (“panning”) independently of the sign panel assembly and be able to tilt from 0 degrees to 40 degrees (relative to the horizontal).
13. The array shall be able to be locked into any position.
14. Be secured by a locking mechanism that prevents rotation during transport of the sign from one location to another.

Provide documentation sufficient in guiding the technician setting up the PDMS to orient the solar panels such that the maximum solar power can be obtained during a typical day.

Plug-in AC Power – Provide an AC-to-DC power converter and a power receptacle to allow the use of power feed from an alternate power source such as a generator set on or adjacent to the trailer or a road-side power service. Provide a plug-in AC power system meeting the following:

1. All wiring from power sources to portable DMS equipment shall use locking cable connectors.
2. Volt and amp gauges shall be provided for DC.
3. Standard negative ground system shall be tied to the sign chassis.
4. Lightning protection shall be supplied to the load side of the sign system's distributed power lines to withstand multiple surges in excess of 600 volts.
5. The power supply shall provide 12V automobile electrical service via a standard cigarette lighter socket for operating a laptop computer.

STATE OF DELAWARE
Department of Transportation

Informational Document- 1.
Sample Report 1
STATE OF DELAWARE
MONTHLY USAGE REPORT

FOR ILLUSTRATION PURPOSES ONLY

State of Delaware

Monthly Usage Report

Supplier Name:	Insert Contract No.	**Report Start Date:**	
Contact Name:		**Report End Date:**	
Contact Phone:		**Today's Date:**	

Agency Name or School District	Division or Name of School	Budget Code	UNSPSC	Item Description	Contract Item Number	Unit of Measure	Qty	Contract Proposal Price/Rate	Total Spend
									$0.00
									$0.00
									$0.00
									$0.00
									$0.00
									$0.00
									$0.00
									$0.00
									$0.00
									$0.00
									$0.00
									$0.00

Note: A copy of the Usage Report will be sent by electronic mail to the Awarded Vendor. The report shall be submitted electronically in **EXCEL** and sent as an attachment to vendorusage@state.de.us. It shall contain the six-digit department and organization code for each agency and school district.

STATE OF DELAWARE
Department of Transportation

Informational Document- 2.
Sample Report 2

FOR ILLUSTRATION PURPOSES ONLY

State of Delaware

Subcontracting (2nd tier) Quarterly Report

Prime Name:							**Report Start Date:**										
Contract Name/Number							**Report End Date:**										
Contact Name:							**Today's Date:**										
Contact Phone:							*Minimum Required		Requested detail								

Vendor Name*	Vendor TaxID*	Contract Name/ Number*	Vendor Contact Name*	Vendor Contact Phone*	Report Start Date*	Report End Date*	Amount Paid to Subcontractor*	Work Performed by Subcontractor UNSPSC	M/WBE Certifying Agency	Veteran/Service Disabled Veteran Certifying Agency	2nd tier Supplier Name	2nd tier Supplier Address	2nd tier Supplier Phone Number	2nd tier Supplier email	Description of Work Performed	2nd tier Supplier Tax Id	Date Paid

Note: A copy of the Subcontracting Quarterly Report will be sent by electronic mail to the Awarded Vendor.

Completed reports shall be saved in an Excel format, and submitted to the following email address: vendorusage@state.de.us

Informational Document- 3.

The Office of Supplier Diversity (OSD) has moved to the Division of Small Business (DSB)

Supplier Diversity Applications can be found here:
https://gss.omb.delaware.gov/osd/

Completed Applications can be emailed to: OSD@Delaware.gov

For more information, please send an email to OSD:
OSD@Delaware.gov or call 302-577-8477

Self-Register to receive business development information here:
http://directory.osd.gss.omb.delaware.gov/self-registration.shtml

New Address for OSD:

Office of Supplier Diversity (OSD)
State of Delaware
Division of Small Business
820 N. French Street, 10th Floor
Wilmington, DE 19801

Telephone: 302-577-8477 Fax: 302-736-7915
Email: OSD@Delaware.gov
Web site: https://gss.omb.delaware.gov/osd/

Dover address for the Division of Small Business

Division of Small Business
99 Kings Highway
Dover, DE 19901
Phone: 302-739-4271

Submission of a completed Office of Supplier Diversity (OSD) application is optional and does not influence the outcome of any award decision.

Informational Document- 4.

PROPOSAL REPLY REQUIREMENTS

The response must contain at a minimum the following information:

1. **Attachment A** - One (1) completed, signed and notarized copy of the Non-Collusion Statement.
   MUST HAVE ORIGINAL SIGNATURES AND NOTARY MARK.
2. **Attachment B** - One (1) completed signed paper copy of the Subcontractor Information Form.
   One form for each Subcontractor, if no Subcontractors submit form and mark it N/A.
3. **Attachment C** - One (1) completed Business References Form.
   Please provide references other than State of Delaware contacts.
4. **Attachment D** - One (1) completed Confidentiality Form.
   Please check box if no confidential or proprietary information is claimed.
5. **Attachment E** - One (1) completed paper copy of each Bid Form.
   Must be legible and contain all Bid Form pages.
6. **Attachment F –** One (1) completed Exceptions Form
7. Electronic cd or thumb drive containing the completed electronic proposal – One original and one redacted.

Proposals must be submitted in writing and respond to the items outlined in this RFP - do not email.

Please fill out the attached forms fully and completely and return with your bid in a sealed envelope clearly displaying the contract number, prior to the date and time bids will be opened.

Bids shall be received at:

State of Delaware
DEPARTMENT OF TRANSPORTATION
Administration Building
Contract Administration
800 Bay Road, Dover, DE 19901

PUBLIC BID OPENINGS

The public bid opening insures the citizens of Delaware that contracts are being bid fairly on a competitive basis and comply with Delaware procurement laws. DelDOT is required by law to publicly open the bids at the time and place specified and the contract shall be awarded within ninety (90) days thereafter. The main purpose of the bid opening is to reveal the name(s) of the bidders(s), not to serve as a forum for determining the apparent low bidders. The disclosure of additional information, including prices, shall be at the discretion of DelDOT until such time that the responsiveness of each bid has been determined. After receipt of a fully executed contract(s), the results will be posted online in order to review pricing and other non-confidential information.

NOTE: ONLY THE BIDDER'S NAME MAY BE READ AT THE BID OPENING

STATE OF DELAWARE
Department of Transportation
Contract No. **DOT**

PORTABLE DYNAMIC MESSAGE SIGNS

Attachment: A

NON-COLLUSION STATEMENT

This is to certify that the undersigned bidder has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this bid submitted this date to the Department of Transportation.

It is agreed by the undersigned bidder that the signed delivery of this bid represents the bidder's acceptance of the terms and conditions of this solicitation including all specifications and special provisions.

NOTE: Signature of the authorized representative **MUST** be of an individual who legally may enter his/her organization into a formal contract with the State of Delaware, Department of Transportation.

	Corporation
	Partnership
	Individual

COMPANY NAME _____ (Check one)

NAME OF AUTHORIZED REPRESENTATIVE _____

SIGNATURE _____ TITLE _____

COMPANY ADDRESS _____

PHONE NUMBER _____ FAX NUMBER _____

EMAIL ADDRESS _____

FEDERAL E.I. NUMBER _____ STATE OF DELAWARE LICENSE NUMBER _____

COMPANY CLASSIFICATIONS: CERT. NO.: _____	Certification type(s)	Circle all that apply
	Minority Business Enterprise (MBE)	Yes No
	Woman Business Enterprise (WBE)	Yes No
	Disadvantaged Business Enterprise (DBE)	Yes No
	Veteran Owned Business Enterprise (VOBE)	Yes No
	Service Disabled Veteran Owned Business Enterprise (SDVOBE)	Yes No

[The above table is for informational and statistical use only.]

PURCHASE ORDERS SHOULD BE SENT TO:
(COMPANY NAME) _____

ADDRESS _____

CONTACT _____

PHONE NUMBER _____ FAX NUMBER _____

EMAIL ADDRESS _____

AFFIRMATION: Within the past five years, has your firm, any affiliate, any predecessor company or entity, owner, Director, officer, partner or proprietor been the subject of a Federal, State, Local government suspension or debarment?

YES _____ NO _____ if yes, please explain _____

THIS PAGE SHALL BE SIGNED, NOTARIZED AND RETURNED FOR YOUR PROPOSAL TO BE CONSIDERED

SWORN TO AND SUBSCRIBED BEFORE ME this _____ day of _____, 20 _____

Notary Public _____ My commission expires _____

City of _____ County of _____ State of _____

STATE OF DELAWARE
Department of Transportation
Contract No. **DOT**

PORTABLE DYNAMIC MESSAGE SIGNS

Attachment: B

SUBCONTRACTOR INFORMATION FORM

<table>
<tr><th colspan="4">PART I – STATEMENT BY PROPOSING VENDOR</th></tr>
<tr><td colspan="2">1. CONTRACT NO.</td><td>2. Proposing Vendor Name:</td><td>3. Mailing Address</td></tr>
<tr><td colspan="2">4. SUBCONTRACTOR</td><td colspan="2"></td></tr>
<tr><td colspan="2">a. NAME</td><td colspan="2">4c. Company OSD Classification:

Certification Number: _____</td></tr>
<tr><td colspan="2">b. Mailing Address:</td><td colspan="2">4d. Women Business Enterprise ☐ Yes ☐ No
4e. Minority Business Enterprise ☐ Yes ☐ No
4f. Disadvantaged Business Enterprise ☐ Yes ☐ No
4g. Veteran Owned Business Enterprise ☐ Yes ☐ No
4h. Service Disabled Veteran Owned Business Enterprise ☐ Yes ☐ No</td></tr>
<tr><td colspan="4">5. DESCRIPTION OF WORK BY SUBCONTRACTOR</td></tr>
<tr><td>6a. NAME OF PERSON SIGNING

6b. TITLE OF PERSON SIGNING</td><td colspan="2">7. BY (Signature)</td><td>8. DATE SIGNED</td></tr>
<tr><th colspan="4">PART II – ACKNOWLEDGEMENT BY SUBCONTRACTOR</th></tr>
<tr><td>9a. NAME OF PERSON SIGNING

9b. TITLE OF PERSON SIGNING</td><td colspan="2">10. BY (Signature)</td><td>11. DATE SIGNED</td></tr>
</table>

Note: Add additional pages as needed.

Attachment: C

BUSINESS REFERENCES

List a minimum of three business references, including the following information:

- Business Name and Mailing address
- Contact Name and phone number
- Number of years doing business with
- Type of work performed

Please do not list any State Employee as a business reference. If you have held a State contract within the last 5 years, please list the contract.

1.	**Contact Name & Title:**	
	Business Name:	
	Address:	
	Email:	
	Phone # / Fax #:	
	Current Vendor (YES or NO):	
	Years Associated & Type of Work Performed:	

2.	**Contact Name & Title:**	
	Business Name:	
	Address:	
	Email:	
	Phone # / Fax #:	
	Current Vendor (YES or NO):	
	Years Associated & Type of Work Performed:	

3.	**Contact Name & Title:**	
	Business Name:	
	Address:	
	Email:	
	Phone # / Fax #:	
	Current Vendor (YES or NO):	
	Years Associated & Type of Work Performed:	

STATE OF DELAWARE PERSONNEL MAY NOT BE USED AS REFERENCES.

Attachment: D

CONFIDENTIALITY FORM

☐ **By checking this box**, the Vendor acknowledges that they are not providing any information they declare to be confidential or proprietary for the purpose of production under 29 Del. C. ch. 100, Delaware Freedom of Information Act.

Confidentiality and Proprietary Information

Note: Add additional pages as needed.

STATE OF DELAWARE
Department of Transportation
Contract No. **DOT**

PORTABLE DYNAMIC MESSAGE SIGNS

Attachment: E

BIDDER: _____

BID FORM

** ALL COLUMNS MUST BE COMPLETED AS INDICATED **
ALL FIGURES MUST BE TYPEWRITTEN OR HANDWRITTEN IN INK

ITEM NO.	QUANTITY	UOM	ITEM DESCRIPTION	UNIT PRICE IN $XXXX.XX
01	10	EACH	Type 1 DMS or Specify Other Type:_____ _____	$ _____
02	5	EACH	Type 2 DMS or Specify Other Type: _____ _____	$ _____
03	6	EACH	Type 3 DMS or Specify Other Type: _____ _____	$ _____
TOTAL BID:				$ _____

Attachment: F

ITB EXCEPTIONS FORM

Proposals must include all exceptions to the specifications, terms or conditions contained in this ITB. If the vendor is submitting the proposal without exceptions, please check the box below.

☐ **By checking this box, the Vendor acknowledges that they take no exceptions to the specifications, terms or conditions found in this ITB.**

……

Bidders may elect to take minor exception to the terms and conditions of this ITB. The Department shall evaluate each exception according to the intent of the terms and conditions contained herein but must reject exceptions that do not conform to State bid law and/or create inequality in the treatment of bidders. Exceptions shall be considered only if they are submitted with the bid or before the date and time of the bid opening. Exceptions must be submitted utilizing this Attachment D to be considered.

The Department maintains sole discretion to reject any vendor exceptions that are submitted.

Page and Paragraph #	Exceptions to Specifications, terms or conditions	Proposed Alternative

Note: Vendor may use additional copies of this form as necessary, but format shall remain the same.